PATENTED INVENTIONS OF THE CSIR

1940-1964

A COMPILATION OF BRIEF PARTICULARS CONCERNING THE PATENT SPECIFICATIONS OF THE COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH FOR THE PERIOD 1940-1964

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH
· NEW DELHI

Rs. 16.00
Sh. 33/-
$ 5.00

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COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH
NEW DELHI

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COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH
RAFI MARG, NEW DELHI, INDIA

Printed by Delhi Printers, 21 Daryaganj, Delhi-6

FOREWORD

India to-day is a research conscious nation. The possibility of speeding up economic development through organized scientific research in the field of industry is no longer a purely academic issue. This changed outlook is to no small extent due to the pioneering efforts of the Council of Scientific and Industrial Research and the achievements of its research workers all over the country.

The increase in research activity has naturally resulted in a growing number of new and useful inventions, which are, in the ordinary course, recorded in patent specifications. It is noteworthy that the CSIR has to its credit nearly a thousand patentable inventions which deserve careful consideration as starting points of new industries particularly adapted to the needs and resources of the country. While some of the patents have already gone into production, a good many are still under investigation in India and in foreign countries, and the problems connected with the adequate working of the patents in the best interest of the country are actively engaging the attention of the CSIR.

The present volume is a compilation of brief particulars of specifications of patented inventions arising from the CSIR's researches during the period 1950–64 and is a supplement to the earlier volume entitled "Patented Inventions of the CSIR 1940-1950" published in 1951. The patented inventions represent a vital part of the total contribution of the research organization to national welfare. The present volume, apart from facilitating reference, deserves the close attention of all who are interested in the promotion of new industries in India. It should appeal specially to those who want to give a fair chance to the creative efforts of Indian inventors and research workers so that the industrial progress of the country can be based on secure foundations.

Director-General
Scientific & Industrial Research

New Delhi
February 16, 1965

FISH TECHNOLOGY EXPERIMENT STATION
C.F.T.R.I.
MANGALORE.

INTRODUCTION

Patents are taken out in the interest of controlled utilization of new researches and also to give effective publicity to the new inventions. Royalties accruing from profitable exploitation of patents serve to augment the funds available for financing research and also reward the inventors concerned. The latter, however, treat patent royalties as purely incidental and by no means the major incentive to research.

The present volume is a compilation of brief particulars concerning the patent specifications of the CSIR for the period 1940 to 1964, and is a supplement to the earlier volume entitled "Patented Inventions of the CSIR 1940–1950". It is a compact record of the achievements of the organization in the field of new and useful inventions during this period. The abridgments are arranged in the chronological order and suitable indexes are given to facilitate reference. The volume will thus be found useful by all those who wish to refer to the Council's patents and also those who have hitherto been handicapped by the difficulties of building up independent compilations.

In including abridgments in this volume, the text of available "Abridgments of Specifications" prepared by the Government of India, the Patent Office, and published by the Manager of Publications, Delhi, have been used; the details have been edited to suit the present purpose. Apart from abridgments, the volume also includes group classification, and several indexes including index of Patent numbers, detailed chronological index, laboratory-wise index etc., for convenient reference.

The brief particulars given in this volume are intended to serve merely as a guide to the Specifications. For full details of any particular invention, the specifications should be consulted.

It is hoped to bring the compilation up to date by the issue of supplements from time to time.

R. B. Pai

Patents Officer, CSIR

New Delhi

February 9, 1965

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1 General Classification

GROUP.	*CONTAINING CLASSES.*
I. Agriculture.	(1) Agricultural Implements. (2) Animals, Housing, Feeding, Catching, Destroying and Farmyard Appliances. (3) Grain and Seeds, Treatment of (Including Treatment and Production of Flours and Meals). (4) Manures and Fertilizers.
II. Sanitation.	(1) Closets, Baths and Like Sanitary Appliances. (2) Drains and Sewers. (3) Sewage, Treatment of. (4) Water and Unspecified Liquids, Purifying and Softening.
III. Chemical Compounds, Inorganic.	(1) Chemical Compounds, Inorganic.
IV. Chemical Processes and Non-metallic Elements.	(1) Chemical Processes and Apparatus. (2) Non-Metallic Elements.
V. Distilling and Evaporating Liquids.	(1) Distilling and Evaporating Liquids.
VI. Filtering and Straining Liquids.	(1) Filtering and Straining Liquids.
VII. Cooling and Heating.	(1) Cooling and Ice-Making. (2) Heating Systems and Apparatus (other than Furnaces and Stoves).
VIII. Drying Systems and Apparatus (Excepting Centrifugal Machines; Distilling, etc.; Steam Superheaters; Heating Systems).	(1) Drying Systems and Apparatus (Excepting Centrifugal Machines; Distilling, etc.; Steam Superheaters; Heating Systems).
IX. Organic Chemistry.	(1) Carbon Compounds, Organic.
X. Cellulose (Non-Fibrous) and Derivatives thereof (Including Artificial Filaments, Sheets Made from Cellulose, Protein and like Solutions).	(1) Cellulose (Non-Fibrous) and Derivatives thereof (Including Artificial Filaments, Sheets Made from Cellulose, Protein and like Solutions.
XI. Fats,, Waxes and Oils.	(1) Fats and Fatty Oils (Excluding Butter and the like). (2) Oils and Lubricants. (3) Waxes, Shellac and Fatty Acids for Soap and Candle Making.
XII. India Rubber, Plastics and Paints.	(1) India Rubber, Gutta-Percha, Mica and Like Materials of Constructive Utility. (2) Plastic Compositions. (3) Paints, Painting and the like.

The official classification scheme of Group Headings and Classes adopted by the Patent Office, Government of India for the "*Illustrated Abridgements of Specifications*" is reproduced.

XIII. *Moulding Plastic and Powdered Substances.*	(1) Moulding Plastic and Powdered Substances.
XIV. *Food Production.*	(1) Aerating Liquids. (2) Beverages, Malt Products and Organized Ferments (other than Aerating Beverages). (3) Decoctions, Extracts, and Infusions Making. (4) Fish and Fishing. (5) Food Preparing and Preserving.
XV. *Cooking and Stoves.*	(1) Cooking, Baking and Kitchen Appliances. (2) Stoves, Ranges and Fire Places.
XVI. *Cigars, Cigarettes and Smoker's Appliances and Tobacco Manufacture.*	(1) Cigars, Cigarettes and Smoker's Appliances and Tobacco Manufacture.
XVII. *Sugar.*	(1) Sugar.
XVIII. *Tea Manufacture.*	(1) Tea Manufacture.
XIX. *Medicine and Surgery.*	(1) Disinfecting and Deodorizing, Including Medical and Like Preparations. (2) Medical and Surgical Appliances.
XX. *Spinning and Twisting Machines for Production of Yarns and Threads.*	(1) Spinning and Twisting Machines for Production of Yarns and Threads.
XXI. *Weaving and Knitting.*	(1) Fabrics, Woven. (2) Knitting and Braiding. (3) Looms.
XXII. *Dyeing, Washing and Treatment of Textiles.*	(1) Dyeing, Bleaching, Washing and like Treatment of Textiles and Textile Material with Liquids and Gases. (2) Fabrics, Finishing and Testing.
XXIII. *Proofing Fabrics and Permeable Materials.*	(1) Proofing Fabrics and Permeable Materials.
XXIV. *Paper and Leather.*	(1) Cutting, Punching and Perforating Paper, Fabrics and like. (2) Harness, Saddlery and Horse Shoes. (3) Leather. (4) Paper.
XXV. *Cements, Bricks and Stone Working.*	(1) Bricks, Blocks, Slabs, Tiles and Pottery. (2) Cement, Concrete, Plaster, Artificial Stone, Asphalt and Refractory Manufacture. (3) Stone Cutting and Working.
XXVI. *Building and Ventilation.*	(1) Buildings and Structures. (2) Chimneys and Flues. (3) Doors and Windows and their Accessories. (4) Ventilation.
XXVII. *Roads and Fencing.*	(1) Bituminous Emulsion. (2) Fencing, Trellis and Wire Netting. (3) Roads and Ways.

XXVIII. *Excavating and Mining and Sub-Aqueous Buildings.*	(1) Excavating. (2) Hydraulic Engineering, Miscellaneous. (3) Mining, Quarrying and Well Sinking. (4) Piles and Pile Driving (5) Tanks and Cisterns.
XXIX. *Valves and Hydraulic Engines.*	(1) Hydraulic Presses, Meters, Motors and Like Apparatus for use with High Pressure. (2) Spray Producers and Sprinklers. (3) Valves and Cocks (other than Engine and Like Valve Actuating Arrangements) and like Apparatus for Regulating flow of Fluids.
XXX. *Lamps and Candles.*	(1) Burners and Burner Fittings. (2) Candles and Tapers. (3) Lamp-Chimneys, Globes, Lenses, Shades, Reflectors and Holders therefor. (4) Lamps for Lighting and Heating (Excepting Burners and Burner Fittings, Chimneys, Globes, Reflectors, etc.).
XXXI. *Furnaces and Kilns.*	(1) Furnaces and Kilns.
XXXII. *Fuel and Gas.*	(1) Cooking and Gas Producers. (2) Fuel Manufacture of. (3) Gas Manufacture (other than by Gas Producers and Retorts) and Distributions. (4) Matches.
XXXIII. *Metallurgy.*	(1) Alloys. (2) Annealing, Tempering and Modifying Character of Metals. (3) Casting Metals. (4) Granulating Fusible Materials. (5) Iron and Steel Manufacture. (6) Magnetic, Electrostatic and like Separators. (7) Metals Extracting and Refining (Excepting Iron and Steel Manufacture and Ores, Treating). (8) Ores, Slimes and Mineral Residues, Treating (Briquetting, Chlorinating, Roasting and like Processes). (9) Tinning, Galvanizing and Coating with Metals.
XXXIV. *Mixing, Pulverising and Separating.*	(1) Centrifugal Machines and Apparatus (other than Fans and Pumps). (2) Grinding, Crushing, Pulverising and like Disintegrating. (3) Mixing and Agitating Machines, and Appliances. (4) Sifting and Separating. (5) Washing Granular, Powdered and like Materials.
XXXV. *Metal Working.*	(1) Metal Working.
XXXVI. *Glass Manufacture.*	(1) Glass Manufacture.

XXXVII.	*Printing, Typewriting.*	(1) Printing. (2) Typewriters. (3) Webs and Sheets and other Flexible Material Feeding and Delivering.
XXXVIII.	*Photography, Scientific and Optical Instruments.*	(1) Cinematography. (2) Philosophical Instruments. (3) Photography. (4) Spectacles and Eye Glasses.
XXXIX.	*Warfare, Fire Extinguishing and Life Saving.*	(1) Alarms, Fire and Temperature. (2) Ammunition and Ammunition Receptacles. (3) Explosives and Pyrotechnics. (4) Fire Extinguishing and Preventing. (5) Life Saving Appliances, Marine and Fire. (6) Small Arms and Machine Guns.
XL.	*Containers, Packing.*	(1) Bags, Purses, Sacks, Portmanteaux, Baskets and Wickerwork. (2) Bottles, Jars and Like Vessels. (3) Boxes and Cases. (4) Hollow-Ware. (5) Packing and Baling. (6) Stoppering, Filling and Opening, Bottles, Jars and Like Vessels.
XLI.	*Advertising, Coinfreed Apparatus, Calculating, Measuring and Weighing.*	(1) Advertising and Displaying Apparatus (Other than Monogramic Apparatus). (2) Calculating, Counting and Cash Registering Apparatus. (3) Coinfreed Apparatus. (4) Clocks and Watches. (5) Fares and Admission Fees, Checking and Speed Indicators. (6) Gauges, Measures of Length and Testing Apparatus. (7) Indicating, Recording and Registering Apparatus, Miscellaneous. (8) Measures of Capacity and Delivering Measured Quantities. (9) Water and Other Liquid Levels, Regulating, Indicating and Registering. (10) Weighing Apparatus.
XLII.	*Books and Stationery, Filing Documents, Writing and Games.*	(1) Adhesive Materials and Composition (Other than Rubber). (2) Books, Stationery, Seals, Ciphers and Educational Appliances. (3) Filling Paper and Like Sheets. (4) Games, Toys and Amusement Apparatus. (5) Labels, Coins, Tokens and Tickets. (6) Writing Appliances, Ink and Receptacles for Writing Materials.
XLIII.	*Abrading, Brushing, Soaps, Hand-Tools and Wood Working.*	(1) Brushing and Sweeping. (2) Handtools. (3) Polishing, Sharpening and Abrading (Other than Compositions). (4) Soaps and Cleansing. Polishing and Abrading Compositions (Including Metal Polishes). (5) Washing and

	Cleaning Buildings and Domestic Articles Other than Clothes. (6) Wood Cutting and Working.
XLIV. Centrifugal and Rotary Pumps, Governors, Turbines.	(1) Centrifugal and Screw Fans and Pumps. (2) Governors, Speed-regulating for Engines and Machinery. (3) Rotary Engines, Pumps, Blowers and like. (4) Turbines, Reaction Wheels and Wind Motors.
XLV. Steam Engines and Locomotives.	(1) Incrustation and Corrosion of Metallic Surfaces Preventing and Removing. (2) Locomotives and Traction Engines, Portable and Semi-Portable Engines. (3) Steam Engines and Engine Details. (4) Steam Generators. (5) Steam Superheaters. (6) Stuffing Boxes.
XLVI. Internal Combustion, Hot Air and Combustion Product Engines.	(1) Hot Air and Compressed Air Engines. (2) Internal Combustion Engines.
XLVII. Compressing and Conveying Gases, Injectors, Reciprocating Pumps and Water Lifts.	(1) Air and Gases, Treating. (2) Injectors and Ejectors. (3) Pumps Reciprocating, for Liquids. (4) Water and Other Liquids and Semi-Liquids, Raising and Forcing Other than by Pumps.
XLVIII. Pipes and Pipe-Joints.	(1) Pipe-Joints and Like Couplings. (2) Pipes and Tubes.
XLIX. Lifting, Loading and Conveying Solids.	(1) Lifting, Loading and Conveying Solids.
L. Railway and Tramway Permanent Way and Systems.	(1) Railway and Tramway Permanent Way and Systems.
LI. Signalling.	(1) Alarms, Burglar and the like, Automatic. (2) Electric Signalling Systems and Apparatus, Other than Telegraphs and Telephones. (3) Railway Signals and Communicating Apparatus. (4) Signals, Miscellaneous.
LII. Cycles, Motor Vehicles, Road Vehicles and Railway Vehicles.	(1) Motor Vehicles. (2) Railway and Tramway Vehicles, Body Details, Buffers and Couplings and Under-Carriages of. (3) Road Vehicles. (4) Springs and Vibration Dampers. (5) Cycles and Like Vehicles.
LIII. Aircrafts and Ships.	(1) Aeronautics. (2) Ships and Boats.
LIV. Bearings, and Lubricating.	(1) Bearings and Bearing Surfaces. (2) Lubricating.
LV. Brakes and Retarding Apparatus.	(1) Brakes and Retarding Apparatus.

LVI. *Wheels and Tyres for Vehicles.*	(1) Wheels and Tyres for Vehicles.
LVII. *Dynamo-Electric Machines, Converters, Supply and Transmission Systems.*	(1) Dynamo-Electric Motors and Generators. (2) Electric Currents Converting and Transforming Other than by Rotary Converters and Rotary Transformers. (3) Electric Supply and Transmission Systems and Apparatus.
LVIII. *Electric Conduction, Insulation, Measurement, Electrolysis and Batteries.*	(1) Batteries, Electric. (2) Capacitance, Resistances and Inductances, Electric. (3) Conductors and Insulators, Electric. (4) Electric Couplings and Cut-outs Other than Electromagnetic and Thermal. (5) Electrolysis and Electro-Deposition. (6) Measuring and Testing, Electrically.
LIX. *Electric Switches and Switch Gear, Motor Control Systems.*	(1) Electric Switches and Electromagnetic and Thermal Cut-outs (Excepting Selector Switches for Telephones). (2) Heating by Electricity. (3) Motor Control Systems and Motor and Like Controllers, Electric.
LX. *Phonographs, Music.*	(1) Bells, Horns, Whistles and the Like. (2) Music and Musical Instruments. (3) Phonographs and Like Sound Transmitting and Reproducing Instruments.
LXI. *Telephone and Telegraphy, Wired.*	(1) Telegraphs, Electric. (2) Telephones and Telephone Systems, Electric.
LXII. *Wireless Signalling and Controlling.*	(1) Wireless Signalling and Controlling.
LXIII. *Thermionic Valves, and Electric Lamps.*	(1) Electric Lamps, Incandescent and Arc. (2) Luminescent Materials and Applications Thereof. (3) Uniting Metal to and Sealing Metal into Vitreous Materials. (4) Vacuum or Low Pressure Apparatus for Electric Discharges.
LXIV. *Fastenings.*	(1) Bolts, Studs, Nuts, Washers and Rivets. (2) Chains and Shackles. (3) Door and Gate Operating Appliances, Hinges and Pivots. (4) Fastenings (Miscellaneous). (5) Locks (Key and Permutation), Safes and Strong Rooms (6) Nails, Hooks, Cotters, Pins, Staple Wedges and Wood Screws. (7) Ropes and Cords.
LXV. *Mechanisms (Miscellaneous) and Motors (Miscellaneous).*	(1) Mechanism (Miscellaneous). (2) Motors (Miscellaneous).
LXVI. *Miscellaneous (Cutlery, Table and Toilet Articles, Furniture, Boots, Dress and Sewing).*	(1) Boots and Shoes. (2) Cutlery. (3) Dress and Dress Fastenings. (4) Furniture. (5) Jewellery. (6) Ornamenting. (7) Sewing and Embroidering. (8) Table Articles. (9) Toilet and Perfumery. (10) Umbrellas and Walking Sticks.

2. Subject-matter Index

Adhesive Materials and Compositions (other than Rubber). XLII(1).

Compositions (for joining surface to surface by a thin layer excepting gelatine gum and starch). 65977.

Gelatine and glue preparation of. 45583, 49033.

Starch, dextrin and gluten, preparation of. 46794, 48640.

Alloys. XXXIII(1).

Containing aluminium but not iron. 37155.

Containing iron. 36182, 61978, 61979, 61980, 62338.

Making processes. 52335, 61978, 61979, 61980, 65231.

Animals, Housing, Feeding, Catching, Destroying and Farmyard Appliances. I(2).

Miscellaneous—

Selection and development. 56310.

Batteries, Electric. LVIII(1).

Dry cells. 28135.

Primary cells, other than dry cells—Electrolytes, depolarisers and electrodes forms and arrangement of 57958, 65696.

Bearings and Bearing Surfaces. LIV(1).

(This heading does not include jewel bearings, for which, see CLOCKS, etc. Furniture castors are indexed under FURNITURE).

Bearings, other than ball, roller and axle boxes. 60120, 64554.

Beverages, Malt Products and Organized Ferments (other than Aerating Beverages). XIV(2).

(This heading does not include making of tea, coffee and like beverages for which see DECOCTIONS, etc. Milk and cream are indexed under FOOD, etc. Steps in the process for the production of beverages involving improvements in cooling, heating, filtering, etc., are indexed under the headings denoting such operations.)

Beverages (including alcoholic beverages produced by fermentation)—

Fermenting. 43542.

Fruit juices, extracts and syrups, lemonades. 49590.

Malts and malting and malt extracts compositions. 64458.

Yeast and other organised ferments (other than Bacteria, cultivating). 40112.

Boxes and Cases. XL(3).

(This heading includes only constructions, fittings and details of containers for displaying, storing and transit of articles and materials. Casings intimately associated with particular articles and not of interest as containers for other articles such as Clock cases are indexed under the headings for the articles.)

Folding, collapsible or knock down cases and crates. 34040.

Bricks, Blocks, Slabs, Tiles and Pottery. XXV(1).

Blocks, slabs and tiles (other than compound). 55602.

Compositions and processes of making blocks, slabs and tiles.

48667, 59456, 59630, 61981, 64716, 65610.

Nos. 27714 to 66228. For subsequent numbers see Laboratory-wise List.

Pottery, manufacture of. 54263.

Buildings and Structures. XXVI(1).

(Buildings sub-aqueous, such as caissons, cofferdams, and sluice gates are indexed under HYDRAULIC ENGINEERING.)

Floors and ceilings (including roofs and roofing).

49353, 54361.

Miscellaneous—

Doubly curved shell. 61645.

Reinforced concrete and reinforcements (constructions of interest apart from structures made thereof).

48923, 49880, 62490, 63865.

Capacitances, Resistances and Inductances, Electric. LVIII(2).

Condensers. 53372, 53462, 53817, 62261.

Resistances. 41336.

Carbon Compounds, Organic. IX(1).

(Excepting CELLULOSE; FATS, etc.; Fatty acids for soap making Glucose; Maltose, etc; Gums; Oils (essential mineral and tar; Starch and dextrin; SUGAR; WAXES).

Dyes and lakes—

Azo dyes (for azo compounds which are not dyes, see substitution derivatives, etc.)

33261, 49852.

Dyes, other than Azo dyes. 31594, 34210.

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57007.

Miscellaneous—64283, 66096, 66196.

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Cysteine with fractionated liquid wood smoke, flavouring substance. No case.

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30502, 30679.

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38062, 38064, 41338, 43544, 43827, 44359, 47766, 50758, 52112, 53651, 53652, 55171, 55757, 56581, 59088, 59606, 65976.

Substitution derivatives of hydrocarbons and heterocyclic compounds other than dyes—

Halogen containing. 34211, 34755, 34756, 34757, 40261, 40753, 40754, 41724, 44262, 44116, 51958, 52003, 56322, 56818, 56935, 61439, 65543.

Nitrogen (but not containing halogen)—

Containing aromatic and hydroaromatic ring system but not containing heterocyclic rings or sulphonamide or sulphonamide group in the molecule.

32486, 33078, 33473, 34411, 34754, 35328, 37566, 39426, 53195, 60865, 65777, 65778.

Containing heterocyclic ring system in the molecule, but containing no sulphonamide or sulphonamide group.

45666, 46994, 50926, 54867, 58902, 58903.

Containing no ring system in the molecule. 29967, 29969, 64957.

Oxygen (but not containing halogen and nitrogen).

Aldehyde, ether, ester and other miscellaneous groups but not containing carboxylic, ketone and hydroxy groups.

46405, 48873, 49836, 58383, 58868, 58870, 59419, 59497, 60864, 60921, 62426, 62497, 63172, 66175, 66197.

Carboxylic groups.

39441, 44486, 44736, 46416, 48934, 51816, 52167, 56391, 58203, 59419, 59927, 62263, 62302, 65543.

Hydroxy groups but not containing carboxylic and ketonic groups.

38823, 40969, 60863, 63719, 64352, 64353, 65890.

Ketonic, anhydride and lactone groups but not containing carboxylic groups.

29374, 50864, 54960, 57541, 57888, 58529, 58756, 59418, 59853, 60826, 62890, 63083, 64959.

Vitamins. 60210.

Cellulose (Non-Fibrous) and Derivatives thereof (Including Artificial Filaments, Sheets made from Cellulose Protein and like Solutions). X.

(Steps in processes for production of cellulose and derivatives involving improvements in connection with bleaching, drying filtering and moulding are indexed under headings denoting such operations).

Esters and ethers of cellulose (including solutions thereof and articles made therefrom).

62751.

Cement Concrete, Plaster, Artificial Stone, Asphalt and Refractory Manufacture. XXV(2).

Cement portland. 50173.

Concretes and mortars, lime magnesia and magnesium carbonate and cement.

46161, 58909.

Refractory substances for furnace, linings and crucibles and for high temperature purposes.

57884, 58553, 58869, 61981, 62352.

Centrifugal and Screw Fans and Pumps. XLIV(1).

Centrifugal fans and pumps—

Impeller blades, construction and mounting of 6416.

Centrifugal Machines and Apparatus (Other than Fans and Pumps). XXXIV(1).

(This heading does not include CASTING METAL; GLASS MANUFACTURE; MOULDING, etc., SPRAY PRODUCERS.)

Density separators. 34692.

Chemical Compounds, Inorganic. III.

(Steps in the production of inorganic compounds involving improvements in connection with condensing, cooling, crystallising, distilling, drying, filtering, grinding and crushing, mixing and packing are indexed in headings denoting such operations).

Acids not containing oxygen.

49851.

Alkali manufacture.

43437, 54828.

Ammonia and ammonium compounds and salts. 54828, 54829.

Carbonates (excepting alkali metal). 54713, 58528.

Compounds, chemical miscellaneous. 65779.

Halides, metallic. 49234, 54604, 54676, 54713, 58243, 58244, 66109.

Oxides and oxy-acids, non-metallic. 63904.

Oxides, hydrates and oxy-acids. 53817, 54395, 56532, 58352, 60333, 61774.

Phosphates, metallic. 47817.

Salts, metallic, miscellaneous—

Aluminium hydroxy chloride. 61801.

Sulphates, metallic. 47597, 48499, 53390, 59713.

Chemical Processes and Apparatus. IV(1).

(This heading includes only processes and apparatus for which no specific provision exists under the other key headings.)

Catalytic agents, preparation and treatment of. 55816, 55817.

Colloidal solutions, dispersions and emulsions other than bituminous emulsions. 43292, 53653.

Liquid and gases separating. 53607.

Miscellaneous processes and apparatus—

Activation of bauxite. 39320.

Absorbent clays. 60866.

Soluble viscous liquid from castor oil gel. 28563.

Solvent extraction. 46714.

Testing and gas analysis. 29842.

Clocks and Watches. XLI(4).

33784.

Conductors and Insulators, Electric. LVIII(3).

Conductive materials and cores for.

53608.

Insulating materials.

48419, 52111, 53462.

Cooking, Baking and Kitchen Appliances. XV(1).

(This heading comprises only the apparatus and utensils indicated by the subheadings. Sauce pans, pails and like hollow-ware are indexed under HOLLOW-WARE.)

Cooking apparatus, field, camp and like. 46981.

Cooling and Ice-Making. VII(1).

(This heading includes only general methods and apparatus for the production of cold and for cooling gases and liquids. Except in the case of items mentioned under sub-heading "Miscellaneous", cooling processes and apparatus applicable for particular purposes are indexed under the headings for such purposes. Thus methods of cooling Dynamo-electric machinery will be indexed under DYNAMO, ELECTRIC, etc.)

Cold and heat retaining vessels (containers of small capacity without cooling or heating means suitable for transporting or storing).

36163.

Cooling gases and liquids (excepting heat inter-changing apparatus and ice making).

45725.

Disinfecting and Deodorizing, Including Medical and Like Preparations. XIX(1).

(This heading does not include washing bottles, sewage treatment and water purifying which are indexed in separate headings).

Insecticides and vermin destroying compositions—

Containing plant extracts.

34410, 35338, 35567, 52338, 59457.

Medicines and other pharmaceutical preparations (excepting drugs of distinct chemical composition)—

External remedies (other than antitoxins, toxins, vaccines and serums).

59265, 59266, 60827, 61772.

Internal remedies (other than hormones, and animal gland extracts).

40968, 40970, 52801, 56724, 56726, 59295, 59455.

Miscellaneous—

Preparation of moldy composition. 39991.

Distilling and Evaporating Liquids. V.

(This heading does not include liquefying and evaporating air and gases, see AIR AND GASES; DRYING SYSTEMS; GAS MANUFACTURE; carburetting see INTERNAL COMBUSTION ENGINES;

distilling metals see METALS, EXTRACTING, and refrigerating systems see COOLING.)

Evaporators and evaporating systems (plants and processes, other than for cracking and distilling hydrocarbons).

60556.

Hydrogenation, destructive of coal, oils and like carbonaceous materials, obtaining liquids by. 66095.

Drying Systems and Apparatus (Excepting Centrifugal Machines; Distilling, etc.; Steam Superheaters; Heating Systems). VIII.

(Removing water from liquid-chemicals by treatment with chemical elements and compounds is indexed under only the headings for chemicals treated.)

Desiccants and absorbents. 54264.

Dyeing, Bleaching, Washing and Like Treatment of Textiles and Textile Materials with Liquids and Gases. XXII (1).

(Apparatus for applying liquids by single passage of material under a single roller or for applying size and other viscous liquids are indexed under PROOFING.)

Treating textiles with liquids and gases, other than for bleaching, dyeing and washing and proofing.

54040, 59835, 65282.

Dynamo-Electric Motors and Generators. LVII(1).

Electromagnets and magnets permanent, construction of.

50574.

Electric Currents Converting and Transforming other than by Rotary Converters and Rotary Transformers. LVII(2).

Transformers—

Regulating and constructional arrangements other than Cores, etc., Bases etc.

56817.

Electric Supply and Transmission Systems and Apparatus. LVII(3).

Systems for supplying and controlling consuming devices (other than motive power plant and storage batteries)—

Automatic systems of regulation.

52711.

Electric Switches and Electro-Magnetic and Thermal Cut-outs (Excepting Selector Switches for Telephones). LIX(1).

Make and break switches, mechanical, adapted for continuous operation.

54959.

Electrolysis and Electro-Deposition. LVIII(5).

Diaphragms, and electrodes, forms, construction and mounting of.

66195.

Processes—

Metals and alloys, obtaining and depositing from aqueous electrolytes.

45565, 45695, 45696, 49355, 51524, 55172, 58353, 58384, 59250, 59712, 59978, 62292, 62293, 62379, 65556, 65646.

Miscellaneous—66148.

Metallic oxides salts and like obtaining by electrolysis.

52394.

Regeneration of baths. 48342.

Non-metallic substance, obtaining and depositing.

45010, 45150, 47982, 52631.

Organic solutions treating (other than liquids treating for purifying).

32970, 39426, 39427, 39428, 39429, 51189.

Fats and Fatty Oils (Excluding Butter and the Like). XI(1).

(Steps in the production of fats and fatty oils involving improvements in connection with aerating, cooling, crushing and grinding, distilling, drying, filtering, mincing, mixing, moulding and preserving are indexed under headings denoting such operations).

Compositions containing fats and fatty oils and drying oils.

64366.

Extracting and obtaining (other than recovering from waste products).

By pressure. 32237,

By solvents. 34873, 45117, 45118, 46793.

Hydrogenated and modified fats and fatty oils.

28002, 28003, 28004, 28005, 28424, 40752, 43149, 45840, 45841, 46457, 47382, 48529, 55423.

Purifying.

33650, 47802, 48530, 61484.

Filtering and Straining Liquids. VI.

Block filters (comprising apparatus in which filtering materials consist of earthenware, stone and other rigid porous materials and compositions).

59608.

Filters with loose filtering materials (other than filter and contact beds).

53348, 54650.

Food Preparing and Preserving. XIV (5).

(This heading does not include tea and like preparations and substitutes. Steps in the process of food production such as bottling, concentrating or distilling, cutting or mincing, drying, emulsifying, filtering, flavouring, grinding, mixing, moulding, and packing are indexed under headings denoting such operations).

Food preparations—

Cereals, vegetable, fruit and confectionary.

47902, 49441, 49838, 49839, 50805, 51525, 64226, 64457, 64956, 65138.

Dairy food.

46995, 47580, 49839, 51525.

Food preserving, sterilising and conditioning—

By gases and vapours. 50122.

By treating with liquid preservatives. 57268, 58305.

Miscellaneous. 63659.

Fuel, Manufacture of. XXXII(2).

(Excepting COKING AND GAS MANUFACTURE).

Liquid fuel preparations (other than solidified and gelatinised oils).

65891.

Solid and powdered fuels (other than solidified and gelatinised oils).

From various forms of carbon (comprising coal, lignite, carbonaceous shales, coke charcoal and soot).

49729, 57013, 61020, 62938, 64523.

Gas Manufacture (Other than by Gas Producers and Retorts) and Distributions. XXXII(3).

(This heading includes the manufacture of combustible gaseous products for illuminating, heating and motive power purposes).

Washing, scrubbing or otherwise treating gases with liquids.

33059, 41722, 41723.

Gauges, Measures of Length and Testing Apparatus. XLI(6).

66079.

Glass Manufacture. XXXVI.

Delivering and gathering molten metal. 55453.

Drawing and extruding. 55453.

Enamels and enamelling, vitreous. 49425, 49555, 49837, 54394, 54433.

Glassware forming by miscellaneous process. 30451.

Miscellaneous—

64225.

Foam glass or cellular glass. 41342, 49524.

Production and purification of metal. 51847, 55452, 56705.

Grain and Seeds, Treatment of (Including Treatment and Production of Flours and Meals). I(3).

(This heading includes the treatment in bulk of single stone fruits and nuts for the removal of pericarp, methods and apparatus not resulting in such modification are indexed under various headings for the processes such as DISINFECTING, FOOD, etc., SIFTING, etc.)

Production and treatment of flour and meal (including processes of mechanical reduction other than treating by air, gases and liquids).

62262.

Roasting grains, cereals and like granular food products.

53319.

Grinding, Crushing, Pulverising and like Disintegrating. XXXIV (2).

(This heading does not include Agricultural implements (AGRICULTURE); Graters and crumblers (COOKING); Hulling, husking and decorticating grains (GRAIN, etc.); Rag engines (PAPER); Preparation of fibres for spinning (SPINNING); Cutting and breaking tea (TEA MANUFACTURE); Thrashing machines (GRAIN AND SEEDS, etc.).

Ball and tube mills. 54263.

Disc and like mills (stone mills). 31510.

Edge-runners and pans and like mills. 55454.

Miscellaneous type of mills and details—

Treatment with mica for facilitating grinding. 31511.

Heating by Electricity. LIX(2).

Resistance furnaces (the resistances forming parts of the furnace or oven). 59658.

Heating Systems and Apparatus (other than Furnaces and Stoves). VII(2).

(Heating processes and apparatus applicable to BURNERS; FURNACES; STEAM GENERATORS; STEAM SUPERHEATERS; STOVES are excluded from this heading).

Non-conducting coverings for heat and sound (including fire proof covering and linings).

41878.

. (Apparatus for effecting transfer of heat from products of combustion are indexed only under STEAM GENERATORS or STEAM SUPERHEATERS).

45725.

Utilising for heating and power purposes solar and natural heat.

46981, 53369.

Hollow Ware. XL(4).

(Excepting bottles for storing air and gases under pressure (AIR AND GASES); bed pans (CLOSETS; BOTTLES, etc.); cold and heat retaining vessels (COOLING); cruet and like receptacles and drinking vessels and other table articles (TABLE ARTICLES); tea and like infusions making apparatus for (DECOCTIONS); and wash-hand basins (CLOSETS).

Non-metallic vessels, other than casks and barrels. 28427.

Tubes or containers, collapsible. 29128.

Hydraulic Engineering, Miscellaneous. XXVIII(2).

(This heading includes subaqueous buildings, canals, flow meters, siphons, sluice gates and the like).

Siphons 58757.

Hydraulic Presses, Meters, Motors and like Apparatus for use with high Pressure. XXIX(1).

Hydraulic transmission of power 29412.

India Rubber, Gutta-Percha, Mica and like Materials of Constructive Utility. XII(1).

Colouring, ornamenting, variegating and metallizing. 45579, 45695, 45696.

Devulcanising and utilising waste.

29155.

India Rubber compositions.

28306, 28307, 30196, 36073, 36074 36318, 44144, 49022, 52014, 66194.

Latex, collecting and extracting from plants.

32352, 32971.

Mica and other naturally occurring materials of constructive utility.

55559.

Miscellaneous—

Artificial board of sheet. 41878, 56582.

Depolymerisation. 34938.

Liquid rubber. 60555.

Rubber, rendering porous, spongy or powder 35331.

Internal Combustion Engines. XLVI(2).

(This heading includes features specially designed and adapted for internal combustion engines. Construction of engine details and accessories of interest apart from internal combustion engines are indexed under such headings as BRAKES; FILTERING; LUBRICATING; MECHANISM; MISCELLANEOUS; STEAM ENGINES; VALVES, etc.).

Miscellaneous—

Crank case ventilation. 35646.

Spray carburettors. 47347.

Lamps for Lighting and Heating (Excepting Burners and Burner Fittings, Chimneys, Globes, Reflectors, etc.). XXX(4).

Vehicle, signal and like lamps. 58597.

Leather. XXIV(3).

(Operations and apparatus of interest apart from making leather are indexed under such headings as DYEING; DISINFECTING.)

Currying, impregnating and other finishing processes.

38063.

Miscellaneous—

Bate composition. 54998.

Impregnating hides and skins with protein liquids. 53798.

Tan. liquors. 55768.

Tanning composition. 44986, 45088, 53637.

Tanning liquor. 43543, 49815, 50782.

Tanning materials. 50067, 50803, 50804, 50806, 50863, 51250, 52657, 52705, 52706, 52707, 52708, 52709, 52798, 52799, 52834, 52835, 55768,

Processes, preliminary to tanning (including apparatus for such processes).

44485, 52013, 56251, 57886, 64354.

Tanning processes, (including apparatus for such processes).

51201, 53196, 53197.

Magnetic, Electrostatic and like Separators. XXXIII(6).

34766, 51625.

Manures and Fertilizers. I(4).

47439, 53347, 54829, 58554, 61585, 62337.

Medical and Surgical Appliances. XIX(2).

Dental operating appliances and instruments. 60828.

Miscellaneous—

Ice bag. 30072.

Metal Working. XXXV.

Fluxes for metal working purposes. 31877.

Miscellaneous—

Lathes for glass working. 36162.

Metals, Extracting and Refining (Excepting Iron and Steel Manufacture) and Ores Treating. XXXIII(7).

(Processes and apparatus for obtaining oxides hydrates, oxyacids and salts from which metal is stated to be obtained by unspecified or by known methods are indexed only under CHEMICAL COMPOUNDS etc. Steps in processes for the treatment of ores involving improvements in connection with drying, grinding, mixing, roasting, sifting and washing are indexed under headings denoting such operations.)

Refining (including recovering tin and other metals from scrap but excluding processes which form part of extraction).

49285.

Wet processes (other than cyaniding and amalgamating).

56725.

Mining, Quarrying and Well Sinking. XXVIII(3).

Boring earth and rock—

Rotary drills. 54907.

Moulding Plastic and Powdered Substances. XIII.

Dies and plungers for pressing thermoplastics. 32824.

Miscellaneous processes and apparatus—

Briquettes and bricks, moulding. 55602.

Spreading by pressure against moving or fixed formers (plunger-operated).

30680, 32823.

Non-Metallic Elements. IV(2).

Carbon, charcoal and graphite. 48385, 58007, 61320.

Sulphur. 49635.

Oils and Lubricants. XI(2).

(Steps in processes for the production of oils involving improvements in connection with cooling, distilling, filtering, heating and mixing are indexed under headings denoting such operations.)

Lubricants—

Lubricants for machinery. 27715.

Ores, Slimes and Mineral Residues, Treating (Briquetting, Chlorinating, Roasting and Like Processes). XXXIII(8).

(This heading is not exhaustive of all processes of treating ores, but is limited to processes as defined by the terms of the sub-headings.)

Open-pan roasting and sintering processes and apparatus.

53817.

Paints, Painting and the Like. XII(3).

(This heading does not include BITUMINOUS EMULSIONS; PLASTIC COMPOSITIONS; polishing compositions for furniture see SOAPS, etc.) and enamels and glazes (see GLASS MANUFACTURE).

Coating and painting surfaces (other than those of continuous lengths of flexible materials in open condition).

33115, 43979.

Coating compositions, non-drying and non-setting and composition applied melted.

35336.

Non-vesicating drying product for lacquer varnishes etc.

29938.

Paints, varnishes and other coating compositions, drying by exposure other than luminous paints.

Miscellaneous—

Paints containing oils, fats, soaps and resins (natural and synthetic and waxes).

29051, 29939, 29940, 31284, 31595, 32969, 33114, 33786, 34937, 42885, 43164, 43544, 44737, 47815, 53636.

Pigments. 33114.

Paper. XXIV(4).

Miscellaneous—

Treating bamboo. 57267.

Paper, boards and compound paper. 31595.

Paper-machines and paper-forming apparatus. 63289.

Pulp, preparation of—

Processes using alkali. 49054.

Waste products, treatment and utilisation of. 41878.

Philosophical Instruments. XXXVIII (2).

(This heading includes surveying, navigational, astronomical instruments and thermometers, meterological and mathematical instruments and miscellaneous physical apparatus.)

Miscellaneous philosophical instruments—

Radiant heat measuring. 44746.

Optical apparatus—

Miscellaneous—65611.

Infra-red spectroscopes. 47264.

Microphotometer. 47348.

Photography. XXXVIII(3).

Plates, films and papers. 45547, 50483.

Plastic Compositions. XII(2).

(This heading comprises mouldable compositions which usually set, compositions containing bitumen, resins, fats, oils and waxes and organic derivatives as important constituents are indexed here. India rubber compositions are indexed under INDIA RUBBER. Steps in processes for the production of plastic compositions involving improvements in connection with drying, emulsifying, grinding, crushing and pulverising, mixing, and testing physical qualities are indexed under headings, denoting such operations).

Albumen, casein, cellulose, dextrine, gelatine, glue, molasses, starch and sugar compositions, but not containing constituents stated above.

33077, 52027, 52028.

Bituminous compositions, 43320, 43321, 54074.

Compositions containing clay, cement, porcelain and like but not containing constituents stated above.

32834.

Oils, fats, higher fatty acids, soaps and condensates from tar distillation compositions containing, but not bitumen, or resins, gums and waxes.

30316, 30503.

Resins, resinates, gums and waxes containing but not bitumen.

31282, 31283, 41339, 41340, 53414.

Polishing Sharpening and Abrading (Other than Compositions). XLIII(3).

This heading does not include polishing of grains and seeds (see GRAINS, etc.); cleaning and polishing knives, forks after use (see WASHING BUILDINGS, etc.); milling and filling metals see METAL WORKING; cutting and working stone see STONE CUTTING, etc.); polishing compositions for furniture and boots (SOAPS, etc.)

47401.

Proofing Fabrics and Permeable Materials. XXIII.

Coating yarns, threads and webs with liquid and plastic materials, apparatus for and processes dependent on such apparatus.

31595.

Fabrics, coated with liquid and plastic materials.

28277, 29939, 29940, 29968, 49364, 62939.

Fabrics, compound and compound sheet materials.

28281, 63685.

Proofing permeable materials against air, bacteria, chemicals, fire, fungi, moisture and vermin (includes only impregnation and hot coating).

Compositions and materials. 33058, 35337, 48275.

Processes. 27714, 48275.

Road Vehicles. LII(3).

Undercarriages. 66228.

Roads and Ways. XXVII(3).

Road scavengering, tarring, watering and other surface treatment of roads and ways.

43866.

Soaps and Cleansing, Polishing and Abrading Compositions (Including Metal Polishes). XLIII(4).

Polishing compositions for furniture, boots and other articles (including stains for wood).

64958.

Springs and Vibration Dampers. LII(4).

Cushioning devices of general and unspecified application (including both system and arangement of springs, and devices other than springs).

29400.

Non-metallic materials, composed wholly or mainly of 60867, 64541.

Stoppering, Filling and Opening, Bottles, Jars, and Like Vessels. XL(6).

(In the heading the apparatus includes also methods depending on such apparatus).

Downwardly seated closures held in position by the other means than auxiliary mechanical devices. 58085.

Mechanical retaining devices disposed in or outside and coating with neck of receptacles, stoppers seated by.

58382.

Sugar. XVII.

(Steps in processes in sugar manufacture involving improvements in connection with distilling, evaporating, drying electrolysis filtering, grinding and crushing, mixing and agitating, and sifting are indexed under headings, denoting such operations).

Glucose, maltose, lactose and like.

39442, 40735, 45138, 46575, 46576, 48719, 51575.

Tinning, Galvanizing and Coating with Metals (Including Treating Metallic Surfaces to Produce Modified Surface). XXXIII(9).

45695, 45696, 55289, 57938, 65230, 65780.

Turbines, Reaction Wheels and Wind Motors. XLIV(4).

(This heading includes also combination of these with one another or with other motors).

Wind motors. 57937.

Uniting Metal to and Sealing Metal into Vitreous Materials. LXIII(3).

53528.

Vacuum Confined Gas and Vapour Apparatus for Electric Discharges. LXIII(4).

Magnetic devices for controlling or influencing discharge (other than in cathode ray tubes) and for adjustment electrodes.

57936.

Ventilation. XXVI(4).

Methods of and arrangement and adaptation of means for ventilation—

Air treating and conditioning (moistening, sterilising and drying, etc.) details in ventilating plant.

45725, 45726.

Water and Unspecified Liquids, Purifying and Softening. II(4).

(This heading includes also processes of hardening and imparting like properties to water).

Liquid and solid reagents, treatment with (including use of zeolites and like reagents).

46857, 47446, 47468, 47766, 61771, 62336.

Waxes, Shellac and Fatty Acids for Soap and Candle Making. XI(3).

Fatty acids (including only oleic and other acids for soap and candle making).

46713.

Shellac and resin and resinous compounds (other than synthetic).

28428, 29966.

Waxes. 47179, 65440.

Wireless Signalling and Controlling. LXII.

Miscellaneous—

Fading recorder. 45609.

Thermionic valve circuits for amplifying, generating, modulating, receiving and relaying—

Generating oscillatory and alternating currents (including high frequency transmitting amplifiers).

45025.

Writing Appliances, Ink and Receptacles for Writing Materials. XLII(6).

28990, 40257, 47816.

3. Chronological List

43149. 18 May 1950 : **Transformation of castor oil gel into a viscous liquid**—J. S. Aggarwal and A. S. Gupta, NCL [Group XI(1)].

A process for the transformation of castor oil gel into a viscous liquid which consists in heating the castor oil gel in an autoclave in presence of steam at about 150°–160°C for 8 hrs. or at 185°–195°C for 4·5–5 hrs. is given. Alternatively only the insoluble portion of the castor oil gel is heated at 185°–195°C for 3 hrs. or at 210°–220°C for 5 hrs. The transformation product obtained is used alone or after modification with vegetable oils, resins, or bituminous substances for the manufacture of elastomers, varnishes, enamels, paints, water proofing compositions and the like materials. Indian Patent Specification No. 43164 has been referred.

43164. 20 May 1950 : **Improvements in or relating to the manufacture of coating compositions**—J. S. Aggarwal and S. C. Sethi, NCL [Group XII(3)].

Relates to a process for the preparation of coating compositions which consists in dissolving in a medium such as varnish oil, petroleum solvent and/or turpentine, metallic derivatives of acids obtained from heat polymerised vegetable oils containing at least 40% of linoleic acid or from gels of such oils such as dehydrated castor oil, safflower oil or tobacco seed oil. The metallic derivatives are prepared from salts of divalent and trivalent metals such as calcium, manganese, zinc, magnesium, aluminium, lead, copper or mercury, which may be used individually in admixture. The polymerisation of the oils is conducted as described in Indian Patent No. 42885, by heating the raw oils at 150°–300°C for 4–12 hours in the presence of catalyst. The polymerised products are then saponified with aqueous alkali and to the resulting soap solution, a water soluble salt of a divalent or trivalent metal is added. Alternatively free acids are obtained either from the alkali soaps by acidification or directly from polymerised oils by hydrolysis under pressure. The gels of the above mentioned oils are obtained by heating the oils at 280°–300°C which in turn are converted into the metallic derivatives. Indian Patents Nos. 28563 and 43149 are referred to.

43320. 15 June 1950 : **Manufacture of bituminous compositions for use as expansion joints or the like**—S. Bagchee, B. C. Mazumdar and S. Siddiqui, Delhi Laboratories [Group XII(2)].

A process for the manufacture of a composition for use as expansion joints or the like consists in dispersing masticated rubber in hot molten bitumen and vulcanising with sulphur and accelerator and rendering the product tacky by mixing with a non-drying oil (other than vegetable oils) such as non-drying mineral lubricating oil or coal-tar distillation fractions (such as light oil, middle oil, heavy oil or anthreacene oil) before vulcanisation. Rubber in any form such as crepe rubber, smoked para rubber, rubber latex or earth scrap rubber or reclaimed rubber may be used. According to the example, rubber is masticated until completely broken down. Accelerator is added to it followed by anti-oxidant, stearic acid, zinc oxide and chinaclay sulphur being mixed last. The compounded rubber is mixed with molten bitumen and the temperature of the composition raised to 140°C so that the mass is vulcanized. The mass is then cooled and cut into blocks of desired size.

43321. 15 June 1950 : **Improvements in or relating to the manufacture of bituminous jointing compositions**—S. Bagchee, B. C. Mazumdar and S. Siddiqui, Delhi Laboratories [Group XII(2)].

A process for the manufacture of bituminous jointing composition for expansion

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For earlier Nos. see *Patented Inventions of CSIR, 1940–50* joints consists in dispersing gelled latex in molten bitumen in presence of 0·5-1·2 parts by weight of hexamine for every 100 parts of bitumen. Gelled latex is prepared by adding latex to cashew shell liquid at 90°–110°C. The proportion of the ingredients may vary as follows with reference to 100 parts by weight of bitumen. Latex (35% dry rubber content) 4–10 parts by weight, cashew shell liquid 25–40 parts by weight, hexamine 0·5–1·2 parts by weight. Mineral lubricating oil (6 to 10% on the weight of bitumen) is added to adjust the softening point of the jointing compound. Indian Specification No. 43320 has been referred.

43437. 8 July 1950: **Extraction of potassium hydroxide from felspar**—E. R. Saxena, D. S. Datar and S. H. Zaheer, RRL, Hyderabad [Group III].

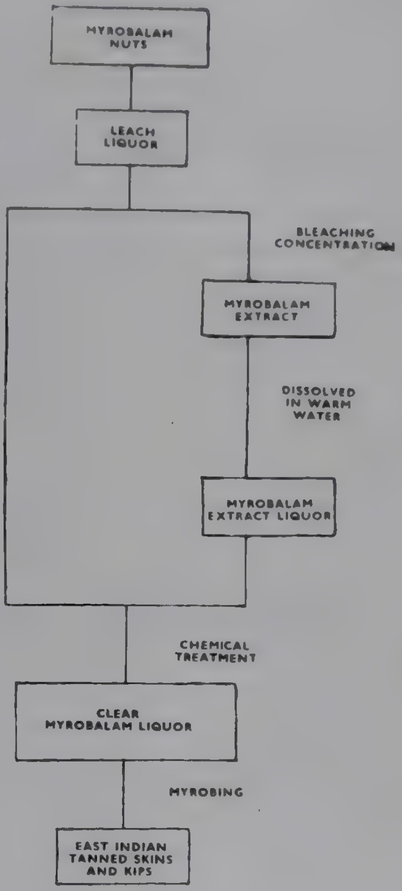
A method for the extraction of potassium hydroxide from felspar wherein a mixture of felspar, calcium sulphate and calcium carbonate is heated in the proportion of 1 : 1 : 4 at 800°–900°C for 4–6 hrs., followed by leaching with water.

43542. 25 July 1950: **Improvements in or relating to fermentation processes**—M. Sreenivasaya and S. R. A. Rao, I.I.S., Bangalore [Group XIV(2)].

A process for the alcoholic fermentation of molasses consists in passing a solution of molasses fortified with nutrients through a battery of columns packed with pumice which is impregnated with yeast. The yeast used for impregnating the pumice is grown under conditions of vigorous aeration, avoiding more than 0·5% of sugar in the reaction medium.

43543. 25 July 1950: **Process for improving the myrobalan liquor used in the myrobing process of East Indian tannage of skins and kips**—K. S. Choudary and R. Selvarangan, CLRI [Group XXIV(3)].

Myrobalam liquor, used in the myrobing process of East Indian tannage of skins and kips, which will result in lighter tanning and reduce its cost, according to the inventions consists in leaching myrobalam nuts, using water as solvent and chemically treating the "leach liquor" thus obtained with sodium hydrosulphite and a clarifying agent such as aluminium sulphate.



As shown in the accompanying flow-sheet the said "leach liquor" may alternatively be bleached, and concentrated and the resulting product known as "myrobalam" extract may be dissolved in water and the "myrobalam" extract liquor obtained, may be subjected to the above mentioned chemical treatment. Moreover, sodium bisulphite may be used instead of sodium hydro-sulphite, alum, sulphate of magnesium, sodium or ammonium, or chloride of magnesium, calcium, sodium or ammonium, may also be used as clarifying agents.

43544. 25 July 1950: **Preparation of modified glycerol phthalate alkyds**—S. L. Kapur and K. K. Sarin, NCL [Groups IX(1) and XII(3)].

Modified glycerol phthalate alkyds are produced by reacting phthalic anhydride, glycerol and fatty acids derived from tobacco seed oil. The reaction may be carried out by heating the ingredients at 150-250°C. in an inert atmosphere for 4 to 12 hr. Unsaturated acids like maleic anhydride may be added to the reaction mixture before the esterification, in an amount of 0·2-5%. Driers such as cobalt and lead linoleates and naphthanates may be added to the modified alkyds. These alkyds are suitable for making coating compositions such as air drying or baking enamels.

The proportion in which various ingredients may be added in the preparation of the alkyd is as indicated below :—

	Phthalic anhydride	Glycerol	Fatty acids
Minimum	5	5	20
Maximum	50	40	90

Indian Patent No. 43979 has been referred.

43827. 28 September 1950 : **Preparation of cation exchange resins**—H. A. Shah and S. L. Bafna, NCL [Group IX(1)].

Cation exchange resins are produced by condensing at least 2 mols. of formaldehyde with 1 mol. of phenolic compound in presence of soluble salt of sulphurous acid. Examples of salts of sulphurous acid are sodium sulphite, sodium metabisulphite and sodium bi-sulphite.

For example, to 230 parts by weight of resorcinol, a solution of sodium bisulphite, sodium hydroxide and formalin is added and the mixture refluxed for 24 hr. To the mixture is added a mixture of resorcinol and formalin. After gelation the product is cured in an oven for 48—96 hr. at a temperature of 80—100°C. The product is washed free of alkali and granuated and sieved to between 20 and 50 mesh. Indian specifications Nos. 30481, 36960 ane 44359 have been referred.

43866. 5 October 1950 : **Improvements in or relating to soil stabilization**—S. K. Chopra, K. R. M. Rao and N. K. Patwardhan, CBRI [Group XXVII(3)].

A process of stabilizing soil consists in mixing the soil with lime sludge and sodium silicate. About 5% sodium silicate powder or commercial syrupy silicate mixed with 2 to 5% lime sludge is suitable for stabilising soil. The soil treated must be a well graded average soil. Such soil may occur naturally or it may be prepared by mixing clayey soil with suitable amount of sandy soil.

43979. 28 October 1950: **Improvements in and relating to the production of wrinkle finishes**—S. L. Kapur and K. K. Sarin, NCL [Groups XII(3), XXII(1) and XLII(1)].

A process for the production of wrinkle finishes consists in preparing a resinous mass by the reaction between phthalic anhydride, glycerol and fatty acids from tobacco seed oil, dissolving the resin in hydrocarbon solvents, adding a drier, applying the resulting composition on articles to give a minimum film thickness of 0·05-0·25 g. of total solids per sq. in., and air drying and baking the film. Pigments may be added to the composition, if desired. The driers added may constitute 0·025-0·15% on the weight of the solution. 2-10% of maleic anhydride may be incorporated in the resinous mass. The baking may be carried out at 60-200°C. for 0·25-5 hr. Wrinkle finishes can also be obtained by mere air-drying of the coated film for 4-5 hr. without baking. The proportion in which various ingredients may be added in the preparation of resinous mass is indicated below:

	phthalic anhydride	glycerol	fatty acid
minimum	15	10	10
maximum	60	50	70

Indian Patent Specification No. 43544 has been referred.

44144. 23 November 1950: **Improvements in or relating to the production of chlorinated rubber**—J. C. Ghosh, B. S. Rao, M. R. A. N. Rao, N. H. I. S. Krishnan and GSR Iyer, IIS, Bangalore [Group XII(1)].

Relates to a process for the manufacture of chlorinated rubber which consists in the chlorination of rubber latex using aluminium as a catalyst to hasten the process of chlorination. In the process an emulsion of latex in carbon tetra-chloride is prepared and to it aluminium chloride is suspended. Alcohol and turkey-red oil are also added to the emulsion. The emulsion is then vigorously stirred and chlorine is led into it while the temperature being maintained below 50°C. When the chlorination is over, the aqueous layer is removed and the carbon tetrachloride solution of chlorinated rubber is subjected to steam distillation to recover the solvent. The solid residue of chlorinated rubber is completely freed from carbon tetrachloride and obtained in the form of a powder.

44359. 2 January 1951 : **Preparation of ion exchange resins and the uses thereof**—H. A. Shah & S. L. Bafna, NCL [Group IX(1)].

Ion exchange resins used for softening and conditioning of water for process industries, according to the invention, are prepared by the condensation of phenolic compounds with acid anhydrides and aldehydes in the presence or absence of catalysts. Thus phenolic compounds like phenol, resorcinol or the like or a mixture thereof are made to combine with > CO group of acid anhydrides such as phthalic anhydride, sulphophthalic anhydride or C-sulphobenzoic anhydride to form a phthaloin type structure. This condensation may be carried out in the presence of catalysts such as dehydrating agent (H_2SO_4) which helps to condense >CO group of acid anhydride with the nuclear hydrogen of the phenolic compound in first stage. In the second stage an alkaline agent like caustic soda may be used as the catalyst.

44485. 14 January 1951 : **Manufacture of picking band leather**—B. M. Das, J. K. De & S. N. Bose, Bengal Tanning Institute [Group XXIV (3)]

Relates to a process for the manufacture of picking band leather for use in textile looms and consists in subjecting the hides to the usual procedure including liming, deliming, bating, pickling and tanning and is characterised in that the hides are delimed and bated in the same bath with the help of an enzyme and 0.5% of a weak acid simultaneously.

Thus 0.5% of lactic acid and 1% enzyme bate on the limed weight of the pelts may be used and wherein enzyme bate may contain an ammonium salt like NH_4 Cl, and $(NH_4)_2$ SO_4. The delimed pelt may be picked with HCl and common salt and tanned with single bath bichromate liquor in 8-9 hr. then neuterlised, sammed and stuffed with soft fats and oil. 4.5% of bichromate solution may be used and added more quickly to the bath i.e. feeding in 4 hr. at an interval of 1 hr. instead of the usual practice of adding it in 6 hr. at an interval of 1.5-2 hr.

44486. 24 January 1951 : **Extraction of tannin from vegetable tannin substances**—B. M. Das, B. Mookerjee & P. K. Sarkar, Bengal Tanning Institute [Group IX(1) XXIV(3)].

The yield of tannins from Babul bark or Goran bark, according to the invention, can be increased by effecting extraction by using a mixture of sodium sulphite and sodium bisulphite. Thus from 2.5% of each sodium sulphite and sodium bisulphite to 4% of each of them on the weight of bark extracted may be used in aqueous solution.

After removal of the leach liquor obtained by soaking the tanstuff overnight in water, sodium sulphite and sodium bisulphite mixture in aqueous solution is used for repeated extraction of tannin at 100°C.

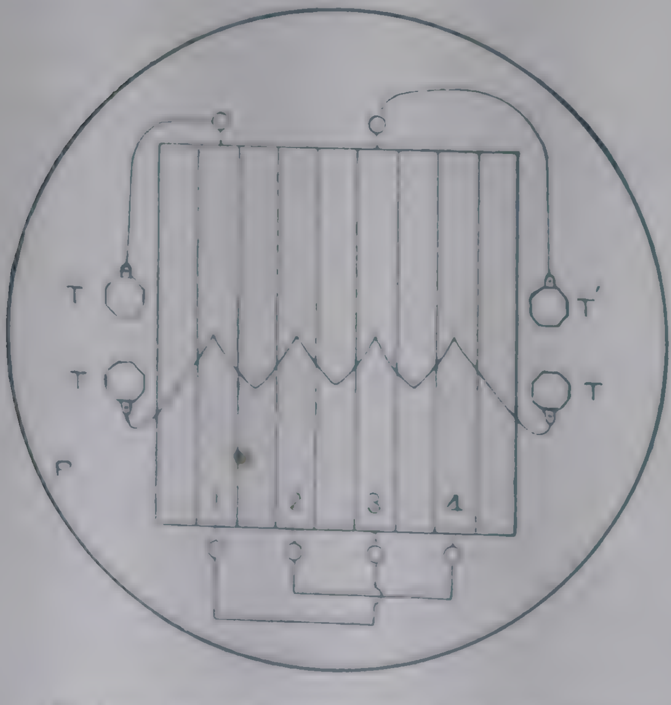
44736. 8 March 1951 : **A process for the manufacture of alpha and beta-kamlolenic acids and derivatives thereof from Kamala seed oil**—J. S. Aggarwal, V. N. Sharma and S. C. Gupta, NCL [Group IX(1)].

Relates to a process for the manufacture of α-and β-kamlolenic acids and derivatives thereof from kamala seed oil. The process comprises saponifying the kamala seed oil, treating the soap obtained to liberate the mixed fatty acids therein and isolating the α-kamlolenic acid from the said mixed fatty acids by treatment with an organic solvent in which it is very slightly soluble. The α-kamlolenic acid thus obtained is converted into β-kamlolenic acid by irradiation in ultraviolet light, if desired in the presence of a solvent and a catalyst. Reducing β-kamlolenic acid by hydrogenation other derivatives such as di-tetra or hexahydro kamlolenic acid may also be obtained.

44737. 8 March 1951: **Air drying wrinkle finish coating composition**—J. S. Aggarwal and P. G. Sharma, NCL [Group XII(3)].

Relates to the production of coating compositions such as varnishes or paints, the films of which on drying in air at ordinary temperature give wrinkle finish effects. The process comprises reacting at raised temperature ranging from 175°–280°C till a thread of 6 to 10 in. can be drawn from a drop of the cooked material taken between the fingers, a vegetable or animal oil (or a mixture of vegetable or animal oils) having conjugated double bonds acid in its fatty acid composition with a natural or synthetic resin or an estergum and wherein the oil is at least one and a half times the weight of the resin or estergum. The oil used is selected from the group consisting of tung oil oiticica oil, chachinda seed oil and karela seed oil. Indian Patent Specification No. 42885 has been referred.

44746. 9 March 1951: **A new instrument for the measurement of infra-red radiation from the atmosphere**—R. S. Kale, Indian Meteorological Office [Group XXXVIII(2)].



Relates to an instrument for the measurement of infra-red radiation from the atmosphere which also enables the measurement of infra-red radiation from the atmosphere during day time. It consists of one or more strips or foils 1,3 of aluminium or lacquer coated silver which reflects the incident radiation and remains in thermal equilibrium with the surrounding air and one or more manganin strips 2,4 covered successively by black layer and MgO layer and which strips or foils in combination with measuring means comprise thermo couples connected to the said strips in series with a galvanometer to indicate the difference between the radiation emitted by the surface and the radiation received from the atmosphere. The two MgO coated strips 1,3 in Fig.1 of the complete specification are connected in series and the remaining two ends T'T' are brought out of the box for making external connections. Similarly the two free ends of the thermo couples (TT) are brought out for external connections.

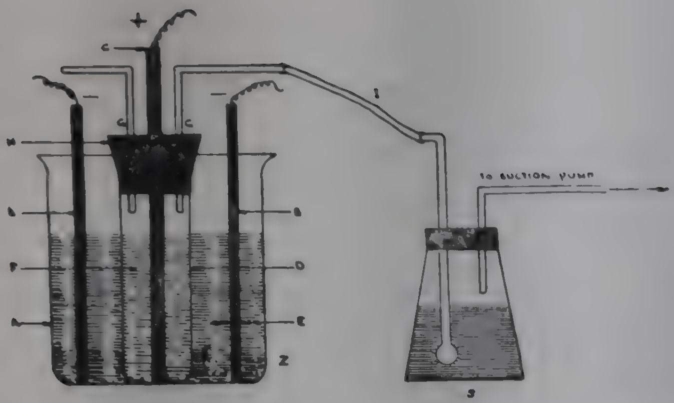
44986. 19 April 1951: **Synthetic Tanning Materials**—S. Siddiqui, M. A. Ghani, Delhi Laboratories [Group XXIV(3)].

Tanning material is produced by sulphonating natural occurring catechol derivatives or their thermal degradation (350°–600°C) products, the proportion of sulphonating agent to the material to be sulphonated varying from 15: 100 to 100: 100. The polymerisation of the material to be sulphonated to water insoluble product is avoided by carrying out the sulphonation at a temperature below 20°C when naturally occurring catechol derivatives is used as such and at a temperature not exceeding 160°C when thermal degradation product of the naturally occurring catechol derivatives is used. Catechol derivatives or their thermal degradation products may be used as starting material for sulphonation, in combination with one or more of the following substances, which improved the gradation of particle sizes; phenols, cresols, hydrocarbons, unsaturated fatty acids, lignings including paper mill wastes.

Indian Patents Nos. 32237 and 34873 are referred to.

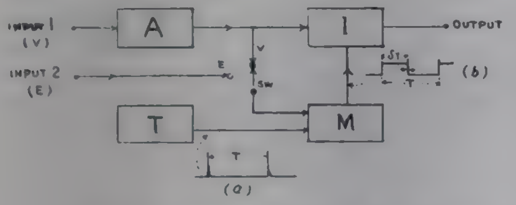
45010. 23 April 1951: **A process for the recovery of beryllium oxide**—T. Banerjee and P. B. Chakravarty, NML [LVIII(5)].

A process for producing beryllium oxide consists in subjecting a solution of beryllium-sodium fluoride to electrolysis in a dia-

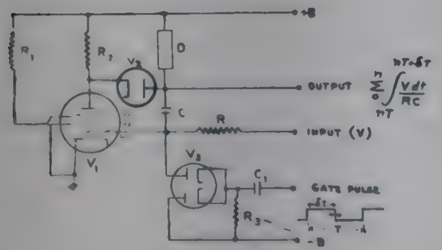


phragm cell. The diaphragm may consist of a porous pot or asbestos cloth. The process may be carried out in a electrolytic cell having a diaphragm D and graphite electrodes B, C. The outer compartment contains a solution of beryllium-sodium fluoride whereas the inner compartment contains sodium chloride solution. Beryllium sodium fluoride is obtained by sintering beryl with sodium ferric-fluoride at 700°C and extracting it with water.

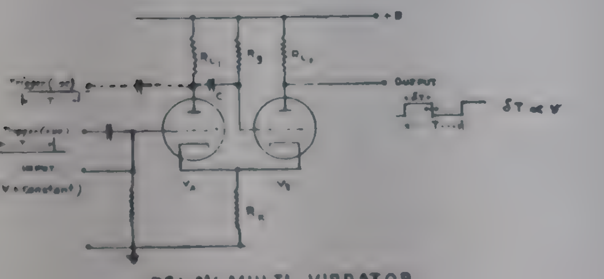
45025. 24 April 1951 : **Improvements in or relating to electronic circuits with particular reference to the manufacture of a variance meter**—Y.D. Altekar, Indian Meteorological Office, Poona [Group LXII].



BLOCK DIAGRAM OF THE INSTRUMENT.



MODIFIED MILLER INTEGRATOR.



DELAY MULTI-VIBRATOR.

An electric circuit, particularly a variance meter for obtaining the products of two variables or squares of variable conforming to the equation $V^2=2fV\ dV$ or $EV=fE.\ dV$ which comprises an integrator in conjunction with a time-modulator which integrator is operable upon receiving a switching, or 'gating' pulse from the time-modulator to integrate the input applied to it as long as the gating pulse lasts, which gating pulse is proportional to the input to the time-modulator. The integrator of the variance meter is adapted to convert the integration with respect to time to that with respect to any other quantity, which in a particular case may be the quantity to be integrated (by making the time of integration proportional to the said other quantity) i.e., by making δt proportional

$$\text{to V in} \int_0^T E.\ dt \ \text{ or in} \int_0^T V\,dt.$$

The Variance Meter consists of an (i) Integrator in conjunction with a (ii) Time-Modulator, operating in such a way that the integrator works only when gating pulses from latter are present, the width of these being proportional to the input to the latter, the output being in the form of amplitude, width or frequency modulated pulses. The integrator such as a Miller integrator is adapted for intermittent operation. The Miller circuit of the Miller integrator has been modified by the inclusion of a diode in its feed back loop, thereby making it possible to hold the plate voltage steady at any value.

45088. 2 May 1951 : **Synthetic tanning materials**—M. A. Ghani and A. L. S. Rao, CLRI [Group XXIV(3)].

A process for the manufacture of synthetic tanning materials from naturally occurring resinol (or resinol derivatives) such as bhilawan shell liquid, cashew shell liquid or the like consists in condensing the resinol with an aldehyde in acid or natural medium, adding phenolic compounds followed by sulphonation to render the product soluble. The sulphonated product may be further condensed with formaldehyde to get an improved product. The said bhilawan or resinol derivative may be such as (a) acetyl derivatives of cashew shell liquids, or (b) thermal degradation products of bhilawan or cashew shell liquids. The process can be extended to resinols comprising similar resinous liquids obtained from the plants anacardicoea like ki Urishi, Rhus Varmicefera or the like. The synthetic tanning material obtained by this process can be further improved by incorporation of the product obtained by the condensation of naphthalene sulphonic acid with formaldehyde. Indian Patent Nos. 44986, 34873 and 32237 have been referred to.

Example	Parts by weight
Cashew shell liquid	100 parts
Acid sulphuric	0·2 parts (sp. gr. 1·82)
Water	200 parts
Formaldehyde (30%)	10 parts

The above are taken together and condensed on water bath (90-100°C.) for 6-8 hr. yielding an yellow emulsions, which is repeated by washing with hot water. To this is added Cresols 100 parts; acetic anhydride 5 parts; and acid sulphuric 50 parts. The mixture is heated on water bath for 4-6 hr., when the watery layer separating out is removed. A further amount of 100 parts of sulphuric acid (sp. gr. 1·82) is added and the product heated on water bath for 6-8 hr. yielding a thick semi solid product, soluble in cold water. The excess of free acid is removed by washing with about 10% saline water.

45116. 7 May 1951 : **Preparation of new bactericidal and surface-active quaternary ammonium compounds**—M. Damodaran and C. Sivaraman, NCL [Group IX(1)].

A process for producing bactericidal and surface active quarternary ammonium compounds consists in reducing unsaturated fatty acids containing 10 or more carbon atoms or fatty acid mixtures, to unsaturated alcohols, converting the alcohols into halide and reacting the aliphatic or alicyclic halide. obtained with pyridine. If the aliphatic or halide contains more than one double bond it may be reacted with a tertiary aliphatic amine, if desired. Fatty acids such as oleic acid, linolenic acid and the like can be used. Fatty acid mixtures obtained from natural oils such as hydrocarpus oil or shark liver oil are also suitable for carrying out the process of the invention.

45117. 7 May 1951 : **Improved process of extracting oil from oil-bearing material**—J. P. Varma, NCL [Group XI(1)].

Process for extracting oil from oil bearing material comprises extraction of the material through aqueous medium with the help of an agent selected from the group consisting of a salt, basic materials, demulsifying agent, acid and wetting agent. Prior to aqueous extraction, the oil bearing material is roasted to a temperature not exceeding 120°C., thereafter it is crushed and digested in water at 85-100°C., in the presence of an agent described hereinbefore. Then the oily product is agitated and the oil is finally separated by a centrifuge. The oil bearing materials are: castor seeds, peanuts, cotton seed, copra, mahua, rape, mustard, sesame and linseed.

45118. 7 May 1951 : **Improved process for extracting oil from oil-bearing material**—J. P. Verma, NCL [Group XI(1)].

In the process of extracting oil from oil bearing material in aqueous medium, the extraction is carried out by means of steam with the help of an agent selected from the group consisting of a salt, basic material, demulsifying agent, acid and wetting a agent. The oil material is firstly roasted to a temperature not exceeding 120°C., then it is crushed and digested water at 85—100°C. with the help of steam in the presence of at least one agent described hereinbefore. Thereafter the oily product is agitated and the oil is finally separated by a centrifuge.

45138. 10 May 1951 : **A new method for the hydrolysis of starch or dextrin to glucose**—R. P. Puri, CFRI [Group XVII].

Relates to hydrolysis of starch or dextrin to glucose which consists in boiling the starch or dextrin with a hydrogen ion-exchanger. An example for the process of carrying out the invention is as follows. One part by weight of the starch or dextrin is taken in a suitable container in the form of a slurry with about 16 parts by weight of water. Four parts by weight of the H-ion exchanger are added to it. The contents are then refluxed till the conversion of starch to glucose is complete. It takes 4-5 hr. for complete conversion. Glucose solution is filtered off, while the H-ion exchanger is washed free of the suspended impurities regenerated with sulphuric acid, washed free of acid and is again ready for use. The ion exchanger used is either prepared from coal or synthetic resions.

45150. 12 May 1951: **A process for the recovery of beryllium oxide**—(Congnate with Patent No. 45010) T. Banerjee and P. B. Chakravarty, NML [Group LVIII(5)].

Cognated with 45010

45547. 24 July 1951: **Preparation of photographic emulsion from comparatively inert gelatine**—K. P. Sinha [Group IV(I) and XXXVIII(3)].

Relates to a process for the preparation of a photographic emulsion which consists in preparing an emulsion with comparatively inert gelatine and silver halides and adding a sensitizer such as allyl isothiocyanate, thiocarbamide or ammonium, sodium or potassium thiocyanate. The amount of allyl isothiocyanate

added ranges from $\frac{1}{10{,}000}$ up to $\frac{1}{4{,}000}$ of the total gelatin employed.

The total quantity of gelatine to be used in the emulsion is added in 3 batches. The first addition is before emulsification. The second is before digestion and the third after washing and final digestion.

45565. 26 July 1951: **Improvements in or relating to brass plating**—T. Banerjee and S. K. Ray, NML [Group LVII(5)].

Relates to process for brass plating. It consists in electro depositing on brass from a bath which is free from cyanide and which consists of sodium cupric tartrate, sodium zincate and at least 3·5—25 g. of caustic soda per litre in solution. α-Brass is preferably deposited from a bath under the following conditions: Copper content, 0.096 M/litre; zinc content, 0·032M/litre; Cu : Zn in electrolyte, 3 : 1; *p*H, 10·5—II·8; current density, 5·2 to 20·8 amp/dm^2; and Temperature, 25—35°C.

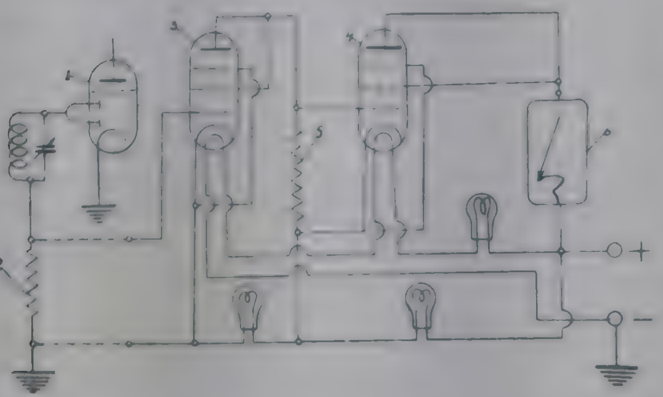
45579. 30 July 1951: **Improvements in or relating to metallization of non-conductors**—T. Banerjee and K. Chakrabarty NML [Group, XII(1) and XXXIII(9)].

Relates to a process for metallization of non-conductors and non-metallic articles such as glass, wood, rubber. It consists in forming and adhering nickel film on the non-conductor using nickel-pyridine complex and employing sodium hydrosulphite, as the reducing agent. The nickel pyridine complex is formed by adding 1% solution of nickel sulphate ($NiSO_4$, $7H_2O$) with 0·5% pyridine. The reaction is carried between 22-30°C. and preferably 28°C. and the solution is kept between 1 to 5% and preferably at 1%. The article to be metallised, other than wood, is sensitized by immersing in sensitizers.

45583. 30 July 1951: **Manufacture of high quality gelatine from indigenous sources of hides and skins**—H. K. Joshi, M. M. Uppal and G. V. Potnis, NCL [Group XLII(1)].

Relates to a process for manufacturing gelatine from raw or dehaired hides, hide cuttings, skins, skin cuttings or the like. The process consists in linting the raw material in 2-4°Be. lime slurry for a period of 3-10 weeks, depending upon the raw material and temperature of liming, washing away the alkali and extracting the gelatine in an extractor. The extraction is carried out at temperatures ranging form 50—85°C. at a *p*H of 4—7 to get different grades of gelatine. Preferably the limed hides are washed with water, then with mineral acid till the core of the hide becomes acidic and finally with water. After extraction, the extracts are decolourised, concentrated, filtered, set to a jelly, cut and dried in an air drier at 25—50°C.

45609. 2 August 1951 : **Radio signals fading recorder**—S. S. Banerjee and R. R. Mehrotra, BHU [Group LXII].



A device for recording the fading of radio signals consists of an amplifier unit for amplifying radio signals and an automatic ink-recording means, which are responsive to the variations in the intensity of the signals and keep a record of the fading of the signals. In Fig. 1, 1 is the second detector valve of any superheat set of which the automatic volume control system is made inoperative. 2 is the lead resistance across which the signal voltage is developed which is applied directly between the grid and the cathode of the first valve 3 of the amplifier. The second valve 4 is directly coupled to the first valve 3. The value of the grid resistance 5 is adjusted such that there be zero current in the plate circuit of the valve 4 when there is no signal. A soon as the signal appears the current through the resistance 2 begins to flow and as a consequence the plate current of valve 4 increases which produces the movement of the pen of the recording galvanometer 6.

45666. 14 August 1951 : **Manufacture of nicotine sulphate from tabacco or tobacco wastes**—J. Gedeon and M. Goswami, NCL [Group IX(I)].

Relates to a process for obtaining nicotine sulphate by extracting nicotine from tobacco or tobacco waste in a broth, eluting nicotine from the broth and obtaining nicotine sulphate from the nicotine carrying organic elutant. The process is characterised in that the nicotine containing broth is obtained by mixing the tobacco or tobacco waste with an alkali such as lime, caustic soda, caustic potash or soda ash, and extracting the wet mixture with a common salt solution. Pulverised tobacco or tobacco waste is mixed with at least 3–5% of lime or corresponding quantities of other alkalies mentioned hereinbefore, and then extracted with 3–5% common salt solution in a tobacco to solution ratio of 1 : 3 or 1 : 4. Thereafter the *p*H of the broth is brought up 11·5 so that the total nicotine may be present as a free base. The elution of nicotine form the broth is done by liquid—liquid extraction using an organic elutant, comprising kerosene, benzene, xylene, toluene, chlorbenzene, dichloroethylene, cyclohexane or the like.

Refers to Indian Specification No. 46994.

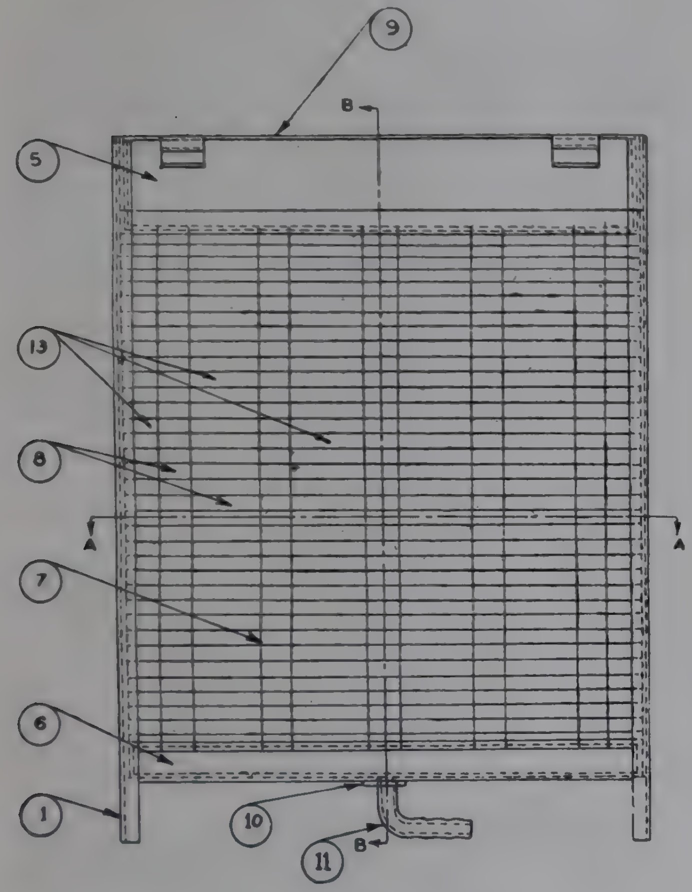
45695. 20 August 1951 : **Electroplating surface of non-conducting materials**—K. Chakravarty, B. N. Ghosh and S. K. Roy, Calcutta University [Groups XII(1), XXXIII(9) and LVIII(5)].

Relates to a process for electroplating surfaces of non-conducting materials. It consists in metallization of the non-conducting materials by forming a primary conducting film of nickel using cobalt complex which is reduced in presence of sodium hydrosulphite prior to electroplating of the non-conductor. The nickel cobalt complex is formed by using a 10% solution of $NiSO_4$, $7H_2O$ mixed with 0·25 to 0·30 c.c. of a 2% solution of cobalt chloride per 100 c.c. of nickel sulphate solution.

45696. 20 August 1951 : **Improvements in or relating to metallization of surfaces of non-conducting materials**—K. Chakravarty, B. N. Ghosh and S. K. Roy, Calcutta University [Groups XII(1) XXXIII(9) and LVII(5)].

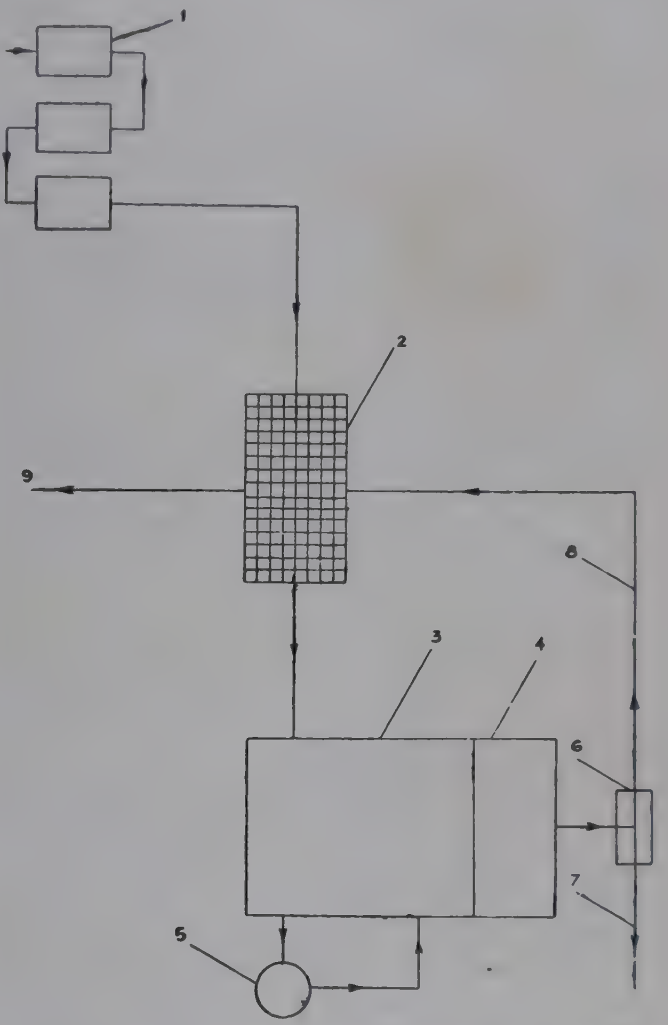
Relates to a process for the metallization of surfaces of non-conducting materials. It consists in metallizing the surface of material by a primary conducting film of copper prior to electroplating the material. The metallising is done by chemical reduction of a cupramine solution in presence of a reducing agent comprising of sodium hypophosphite or sodium hydrosulphite. The reducing bath is formed by means of 10% solution of $CuSO_4$, $5H_2O$ to which concentrated ammonia is added till its *p*H is between 8·8 and 9·0. The reducing agent is added till the cupramine solution turns colourless. The non-conducting materials are glass, wood, etc.

45725. 25 August 1951 : **An improved cooling apparatus**—M. L. Ghai, NPL [Groups VII(1) VII(2) and XXVI(4)].



Relates to a cooling apparatus. It consists of a secondary surface of fins and primary surface of tubes or the like on which the fins are mounted and wherein the primary surface, or both the primary and the secondary surfaces are partly or wholly of porous materials, which permit the therein contained cooling liquid to ooze through. As shown in the figure 7, the porous tubes form the primary surface and 8, the fins form the secondary surface which may or may not be porous. The upper and lower tanks, 5 and 6, communicate with the tubes, 7. Holes, 12 are provided in fins, 8 to allow passage for and contact with tubes, 7. In operation, water is filled in tanks 5, 6 and tubes, 7 and it oozes out from the tubes or from the tubes and fins. Air is passed in the spaces, 13 between the fins and is cooled by conduction of heat from water as well as by evaporation of water.

45726. 25 August 1951 : **Improvements in or relating to air-conditioning or cooling systems**—M. L. Ghai, NPL [Group XXVI(4)].



Relates to an air-conditioning or cooling system. It consists in causing dry air to enter a spray chamber wherein air stream gets cooled on account of evaporation of water and the air prior to its entry in the spray chamber is pre-cooled. As shown in the figure, 1 is the drying equipment, 2 the air to air heat exchange, 3 the spray chamber, 4 the blower, 5 the water pump, 6 the air distributor, 7 and 8 are conditioned air, and 9 is the exhaust air. In an operation the air after getting dry in the equipment 1 is cooled in heat exchange, 2 and is further cooled by evaporation in chamber 3. Part of the cooled air is sent back to exchanger and part is utilised for cooling of a building.

45840. 14 September 1951 : **Improvements in or relating to accelerated heat bodying of drying oils**—S. A. Saletore and P. Sen, Laxminarayan Institute of Technology, Nagpur [Group XI(I)].

A process for heat bodying of drying oils such as linseed oil consits in heating the drying oils at 280-290°C. in the presence of activated bauxite. The activated bauxite used may be prepared by the method disclosed in Indian Patent Specification No. 39320. Preferably the bauxite is activated by heating it at 300-500°C., then treating it with concentrated hydrochloric acid and finally heating it again at 300-500°C. For heat bodying acid refined drying oils the bauxite used is preferably activated by acid treatment followed by thermal treatment as described above emitting the initial thermal treatment.

45841. 14 September 1951 : **Improvements in or relating to the isomerization of drying oils such as linseed oil**—S. A. Saletore and P. Sen Laxminarayan, Institute of Technology, Nagpur [Group XI(1)].

A process for the isomerisation of drying oils such as linseed oil consists in heating the oil at 150-250°C. in presence of activated bauxite. The activated bauxite used may be prepared by the method disclosed in Indian Patent Specification No. 39320. The activity of the bauxite catalyst can be improved by modification of the process described in Specification No. 39320. Whereas, in Specification No. 39320 the bauxite after acid treatment is thoroughly washed free from dissolved iron and free HCl, in the modified presence now proposed the washing is reduced to the minimum to remove the excess of the acid without removal of any water soluble constituents remaining in the product. The heating of the oil may be carried out for 3·4 hr. preferably for 4 hr.

46161. 8 November 1951 : **Manufacture of white cement**—E. R. Saxena, D. S. Datar, and S. H. Zaheer, RRL, Hyderabad [Group XXV(2)].

A process for the manufacture of white cement consisting of digesting iron free felspar and calcium oxide in the proportion of 1 : 2 by weight, filtering off potassium hydroxide formed and heating the sludge at 1400-1600°C. The sludge can be obtained by separating potassium oxide formed when iron free felspar, calcium carbonate and calcium sulphate in the proportion of 1 : 4 : 1 are heated at 800-900°C. for 4-6 hr. Felspar containing upto 0·035% of iron impurities can be used.

46405. 19 December 1951 : **A process for the preparation of tetraethyl pyrophosphate**—P. L. Sawhney and T. R. Seshadri, Delhi University [Group IX(1)].

Tetraethyl pyrophosphate is prepared by reacting an ester of ethyl alcohol namely, diethyl sulphate or ethyl indide with sodium pyrophosphate in a solvent medium. According to the example, sodium pyrophosphate (1 mole) is heated with diethyl sulphate (4 moles) in the presence of dry acetone as the solvent, the reaction being carried out at the boiling point of the solvent and at atmospheric pressure. The solution is filtered, the solvent removed, and tetraethyl pyrophosphate is obtained by vacuum distillation. The compound is used as a contact insecticide.

46416. 22 December 1951 : **Manufacture of levulinic acid**—N. S. Rao and S. H. Zaheer, RRL, Hyderabad [Group IX(1)].

Heating a mixture of molasses, water and hydrochloric acid with alkali bromide.

46457. 31 December 1951 : **Improvements in or relating to the dehydration of castor oil**—M. A. Sivasambham, S. A. Saletore and S. H. Zaheer, RRL, Hyderabad [Group XI(1)].

A process for the dehydration of castor oil which consists in heating refined castor oil to a temperature of 180-200°C. in the absence of air, adding a mixture of sodium bisulphate and sodium bisulphite and maintaining same at a temperature of 220°-240°C. till dehydration is over, treating with a basic substance like zinc oxide or slaked lime after the dehydration and cooling quickly in absence of air.

46575. 24 January 1952 : **A process for saccharifying cellulosic material particularly agricultural residues**—N. R. Kuloor and K. Manivannan, SRIFIR [Group XI(1) and XVII].

A process for saccharifying cellulosic material, particularly agricultural residues, which consists in removing the pentoses by hydrolysis with 1-5% preferably 1-2%, sulphuric acid at 100-150°C, freeing the hydrolysed mass of the acid used, drying the residue, followed by hydrolysis of the dried residue, is characterised in that the said hydrolysis of the dried residue is done with dilute sulphuric acid (0·1-.1·0%) at a temperature of 170-210°C. The hydrolysis of the dried residue is carried out in cycles and the resulting glucose in solution form is removed after each cycle. The final residue contains lignin. The term "agricultural residues" includes processed plant materials composed substantially of cellulose and containing "pentosans" or "hemicellulose".

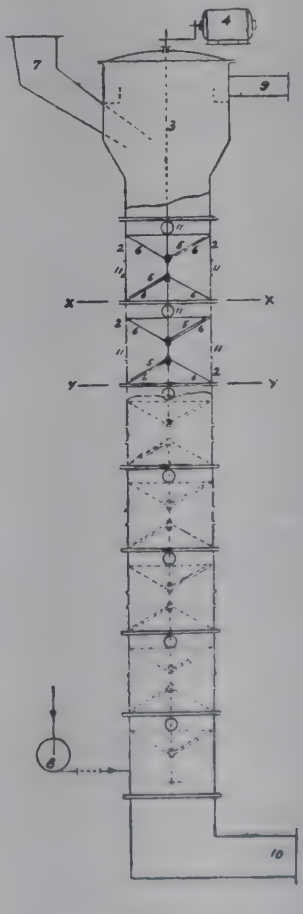
46576. 24 January 1952: **A process for saccharifying cellulosic material such as agricultural residues**—N. R. Kuloor and K. Manivannan, SRIFIR [Groups IX(1) and XVII].

A process for saccharifying cellulosic material such as agricultural residues or the like which consists in hydrolysing the said material with 1-5% sulphuric acid, removing the 5-carbon sugar solution from the hydrolysed mass, drying the residue and impregnating it with concentrated sulphuric acid (65-90%, preferably 70-85% conc.) and further hydrolysing at boiling temperature for about 4 hr. at atmospheric pressure is characterised in that prior to the said further hydrolysis, the acid impregnated free flowing residue is incubated at 40-80°C., preferably 50-70°C. for 5-120 min. up to a state when the said residual mass ceases to be free flowing. The term "cellulosic material" includes all plant materials or processed plant materials containing substantial amounts of cellulose. The 6-carbon sugar obtained by this process is dextrose. The incubated acid impregnated residual mass can be made into a slurry with water bringing the concentration of sulphuric acid to about 8-12%. The hydrolysate containing 6-carbon sugar solution if removed, leaves a residue which is principally lignin. Specification No. 46575 has been referred.

46713. 13 February 1952: **Utilization of the seeds oil nim for the production of oleic acid, stearic acid, palmitic acid and/or 'Stearin'**—C. Mitra, NCL [Group XI(3)].

A process for the utilisation of the seed oil of nim (*Melia azadirachta*; *Melia indica*) for the production of oleic acid, stearic acid, palmitic acid and/or 'stearin' consists in splitting the glycerides contained in the oil by saponification of the oil, preferably the oil obtained after solvent extraction and subsequent acidification. The solid acids may be separated from the liquid ones either by pressing or by fractional crystallisation from solvents like ethyl alcohol, methyl alcohol, acetone, ether, petrol ether or the like. Specification Nos. 33649, 33650, 33651 and 48530 have been referred.

46714. 13 February 1952: **A solvent extractor**—V. K. R. Rao, CFTRI [Groups IV(1) and XI(1)].



Relates to a solvent extractor comprising a column 1 to hold the solvent and treated material, which column is made of segments or sections, 2 joined together, a central rotating shaft, 3 passing through the said sections and fitted with a rotating scraper arms, 5 which sweep around and across, on top of the curved plates, 6 provided between the sections, which plates are partially cut open radially as at 6a, to provide for the down flow of material and upflow of solvent. The scraper arms, 5 sweep around the plates, 6 but on account of the slope of each plate the material on it swept not only around but also by reason of the force of gravity, the material rolls across the plate towards the centre and towards the periphery, on alternate plates, thus resulting in a movement across the plates. The material to be extracted enters through hopper, 7 and the solvent like petrol or alcohol enters at the bottom by means of pump, 8, rises up the column and finally leaves the extractor at the top through opening, 9 having become rich with the extracted soluble component. The extracted material residue passes out from the outlet, 10.

46793. 27 February 1952: **Improvements in or relating to solvent extraction of oleaginous materials**—Y. K. R. Rao, CFTRI [Group XI(1)].

A process for the solvent extraction of oleaginous materials such as oil seeds or oil cakes consists in extracting the oil from oleaginous materials by means of a solvent such as alcohol or alcohol-petrol mixture at temperatures above the critical solution temperatures and cooling the liquid extract below the critical solution temperatures thereby causing phase separation, resulting in the formation of distinct liquid layers; one phase containing the alcoholic solvent and the other oil, which can be separated e.g., by mechanical means such as decantation or siphoning. The oleaginous materials are conditioned by size reduction, flaking and steaming before treating with the desired solvent. The extracting solvent, either ethyl alcohol or a mixture of it with petroleum distillate of boiling range 60°-100°C may be preheated to 30°–80°C and allowed to flow on the material being extracted. The materials and solvent are mixed together and kept agitated continuously at operating temperature from 30°–80°C for a period of 5–30 min. To effect complete extraction, the extraction may be repeated with fresh solvent in batch operation in a continuous current extractor, the solvent to material ratio may be to increase as operating results indicated. The solvent to material ratio may vary from 1 : 1 to 4 : 1 depending upon the oil content of material. After extraction the oil is separated from the hot liquid extract.

46794. 27 February 1952: **Improvements in or relating to starch manufacture**—V. Subrahmanyan, G. Lal, D. S. Bhatia, N. L. Jain and G. S. Bains, CFTRI [Group XLII(1)].

A process for the manufacture of starch which consists in physically disintegrating plantain stems (or banana stems) by grinding and separating the starch from the fibrous matter e.g., by tabling or cloth filtration, is characterised in that plantain stems (or banana stems) felled at the time of full maturation of the bunch are employed. The stem is treated in the presence of a reducing agent like sulphur dioxide to prevent darkening of the material. For disintegrating the materials and separating the starch, grinding equipment such as the emery wheel is used for cutting and processing equipment, stainless steel, wood and stone are employed excluding cast iron or steel.

Example

Banana stem (variety, Madhuranga) weighing 50 lb. was subjected to crushing and subsequent operations as outlined in the process. This variety gave a yield of 4·08% starch.

46857. 10 March 1952: **Cation exchange resins**—H. A. Shah and S. L. Bafna, NCL [Groups II(4) and IX(1)].

A process for the preparation of cation exchange resins consists in adding to cashewnut shell liquid a resinifying or gelling agent such as sulphuric acid or formaldehyde, heating the gel thus obtained to 90°–165°C for 18–96 hr. and thereafter sulphonating it. Highly halogenated solvents such as carbon tetrachloride, ethylene dichloride, and the like may be used as the medium for carrying out the sulphonation. If desired sulphonation catalysts such as lead salts, manganese salts, silver salts etc., may be used during sulphonation. Indian Patent Specification No. 43827 has been referred.

46945. 24 March 1952: **Manufacture of saponins (commercial grade) from Indian soap-nuts**—J. Gedeon, NCL [Group IX(1)].

A process for the manufacture of saponins (commercial grade) consists in the separation of saponins from soapnuts (Sapindus mukorossi Gaertn et laurifolius) by fractional precipitation of an aqueous soapnut extract with ammonium sulphate. Dry soapnuts are powdered, the powder admixed with water and boiled. The liquid is then settled and the supernatant liquor decanted. To the decanted liquor 20% solution of ammonium sulphate is added. The impurities settle to the bottom and the clear liquor is decanted. To this liquid ammonium sulphate is again added to saturation. Saponins are precipitated in the form of a plastic mass which floats on the top.

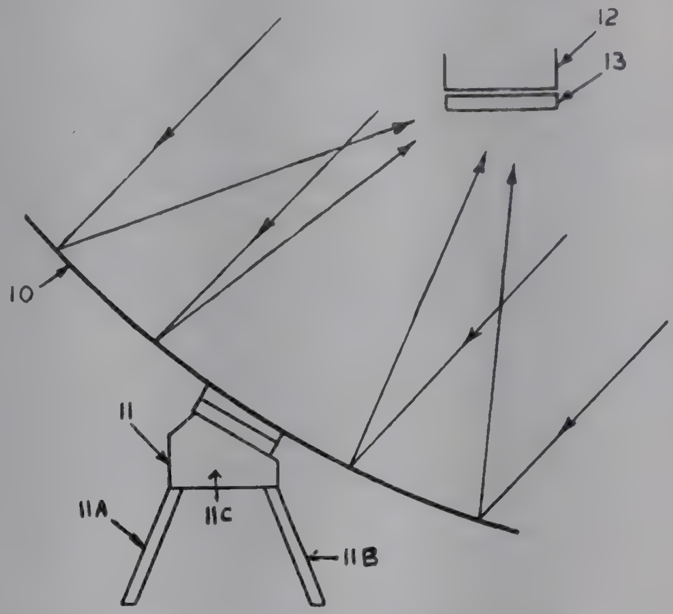
46946. 24 March 1952: **Improvements in or relating to the manufacture of saponins (commercial grade)**—J. Gedeon, NCL [Group IX(1)].

Saponins (commercial grade) are isolated form shikakai (*Acacia concinna*) by precipitation from an aqueous solution with industrial alcohol. Shikakai pods are powdered, extracted with hot water, and concentrated. From the concentrate the seponins are precipitated in the cold with industrial alcohol and the precipitate separated by filtration at pressures not below 20 p.s.i. The saponins are washed with alcohol, and dried at 80°C.

46947. 24 March 1952: **Isolation and separation of bitter constituents from the trunk and/or root bark of nim**—S. Bhattacherji and C. R. Mitra, NCL [Group IX(1)].

A process for the isolation of the bitter principles nimbidin, nimbin and nimbinin from the trunk and/or root bark of nim comprises the repeated extraction of the trunk and/or root bark of nim at ordinary temperature (20°–40°C) with 40–95% of solvents, such as ethyl alcohol (but excluding methylated spirit which is not desirable), methyl alcohol acetone or with a mixture of such solvents. For efficient extraction powdering of the trunk and/or root bark is desirable. The bitter constituents are isolated by concentrating the alcoholic or like extract to one-tenth volume approximately and subjecting the concentrate to selective action of organic solvents such as alcohol, acetone, ether, ethyl acetate, or a mixture of such solvents, of petrol ether. Specifications Nos. 13345, 33649, 33650 and 33651 have been referred.

46981. 28 March 1952: **Solar cooker**—M.L. Ghai, NPL [Groups VII(2) and XV(1)]



A solar cooking device consists of a base frame, 14 provided with legs, 15, a fixed plate, 16 mounted on the base, a movable plate, 17 on the fixed plate, 16 within a central pin is fixed to the movable plate and passing through the fixed plate, permitting rotation of the movable plate around a vertical axis, a turning device, 19 mounted on the movable plate and carrying the optical element, 10 and a cooker, 12, the said optical element consisting of a curved paraboloidal reflecting surface for concentrating and focussing solar radiation and the said turning device allowing movement of the optical element and cooker about an axis other than the vertical axis. The optical element, 10 is secured to the turning device, 19 by attaching a circular flange on the outer edge of the optical element to an annular ring, 23, welded to annular braces, 22, themselves welded to a plate, 25 held rigidly by the turning device, 19. One particular embodiment of the device, 19 consists of a toothed sector firmly attached to 19 and meshing with a warm gear which is operated by a hand wheel, 20. The cooker, 12 rests on a ring, 26 secured to arms, 27 to 29 the other ends of which are attached to the annular ring, 23. A transparent surface consisting of a flat plate of transparent material such as glass, plastics, is held in the ring, 26. The cooker, 12 may be a blackened or non-blackened insulated or non-insulated pressure cooker consisting of a vessel with a lid light enough to hold steam or vapour from the cooking materials inside the vessel. The lid has a handle, 32 and a hole, 33 fitted with a stopper, 34.

46994. 29 March 1952 : **Extraction of nicotine and an extraction tower for the purpose**—J. Gedeon, NCL [Group IX(1)].

Relates to a process for the extraction of nicotine from tobacco broth, which consists in the elution of tobacco broth as heavy phase with a solvent as a light phase in a liquid—liquid extraction tower working on the counter current principle wherein the tower is provided with rotating discs, the rotation of which ensures the optimum contact between the two liquid phases by controlled dispersion of one phase into the other. In the tower is provided a shaft on which circular rotating discs are mounted and the surface contact of the two phases is controlled by the speed of the rotating discs. The emulsification is avoided by keeping the r.p.m. not higher than 300 kerosene is used as a light phase and the nicotine broth of a pH 11 is used as a heavy phase. The time of contact and efficiency of extraction is controlled by the number of the rotating discs. The preparation of the tobacco broth is described in the Indian Patent Specification No. 45666.

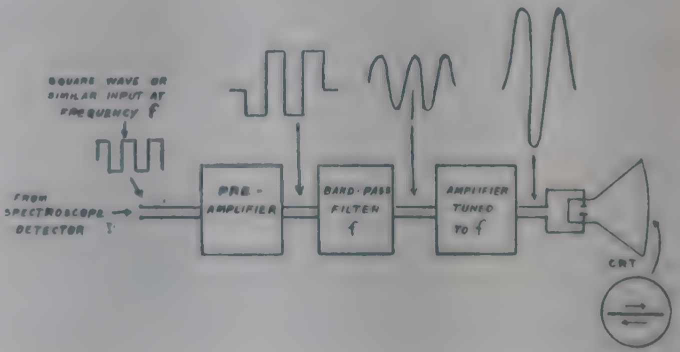
46995. 29 March 1952 : **Preparation of a malted milk product**—M. R. Chandrasekhara, M. Swaminathan and D. S. Bhatia, CFTRI [Group XIV(5)].

A malted milk product is obtained by mixing with milk a malt extract prepared from ragi or cholam and a grain such as wheat or maize. The mixture is concentrated and the resulting product is dried. The milk employed consists of consumable milk such as primary milk, vegetable milk e.g., milk yielded by the cow tree of venezuela, synthetic milk such as soyabean milk, groundnut milk, milk powder of the like.

47179. 26 April 1952 : **Improvements in or relating to sugarcane wax**—A. B. Kulkarni, NCL [Group XI(3)].

A process for producing sugarcane wax consists in bleaching crude sugarcane wax or refined wax obtaind by solvent extraction with an oxidising agent selected from the group consisting of chromic acid, ammonium dichromate, dichromates or chromates of alkali or alkaline earth metals, potassium permanganate and hydrogen peroxide. The bleached wax made by this process may be improved by esterifying its fatty acids with alcohols. Addititional desirable properties can be given to this modified wax by neutralising its remaining acidity with alkalies.

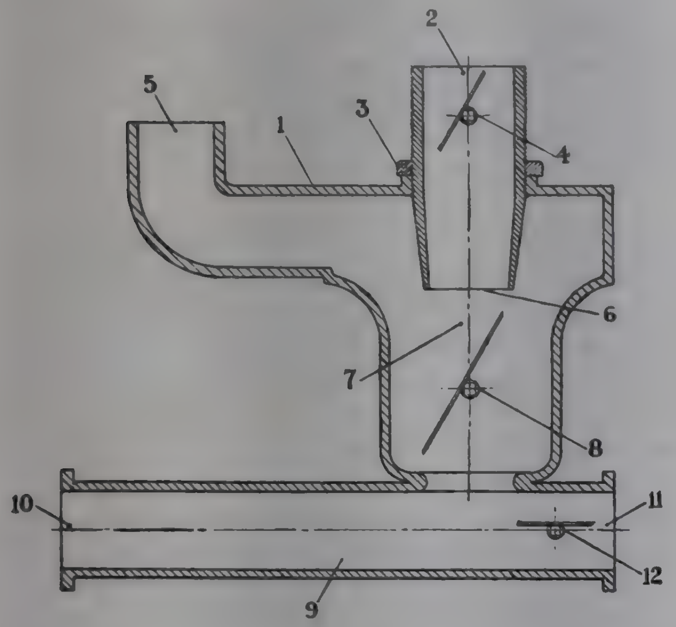
47264. 8 May 1952 : **A high speed recorder for use with infra-red spectroscope**—A. U. Momin, Indian Meteorological Office, Poona [Groups XXXVIII (2), XXXVIII (3) and LVIII(7)].


SQUARE WAVE OR SIMILAR INPUT AT FREQUENCY f
FROM SPECTROSCOPE DETECTOR
PRE-AMPLIFIER
BAND-PASS FILTER f
AMPLIFIER TUNED TO f
CRT

A high speed recorder for use with infra-red spectroscopes consists of means for displaying on a cathode ray tube the signal produced by the detector of a light modulated infra-red spectroscope and means for making a record of the same on a moving photographic film at a comparatively high speed, as a function of wave length of the radiation falling on the detector.

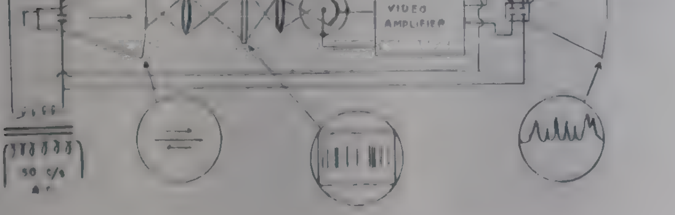
The output of the detector of a modulated infra-red spectroscope is fed to a pre-amplifier and a filter net-work with a narrow band-pass characteristic for the modulating frequency f. After this the signal is passed on to a high gain amplifier tuned to the frequency f, from where it is fed to a cathode ray tube. The resultant trace on the screen of the cathode ray tube is photographed on a continuously moving film, the motion of the film being at right angles to the motion of the cathode-ray spot.

47347. 23 May 1952: **A gas carburettor**—M. L. Khanna and S. K. Das Gupta, NPL [Group XLVI (2)].



In a gas carburettor comprising an air inlet (5), gas inlet (2) and a mixing chamber (9), the gas inlet is a converging or constricted tube, which causes a pressure drop at the converging or constricted end of the tube, which pressure drop controls the volume of air sucked in, for the gas air mixture. In the illustration the throttle valve (8) controls the entry of gas-air mixture into the tube (9) connected at one end (10) to the engine manifold (not shown) and a petrol carburettor (not shown) at the other end (11). The throttle valve (12) controls the petrol carburettor and unlike the mechanical type of carburettors the throttle valves (8) and (12) are not interconnected.

47348. 23 May 1952: **A micro-photometer for rapid examination of spectrum plates or the like densitometric measurements**—A. U. Momin, Indian Meteorological Office [Groups XXXVIII (2) and LVIII].


HORIZONTAL DEFLECTION PLATES
CRT₁
SPECTRUM PLATE TO BE EXAMINED
LENS(L₁)
LENS(L₂)
PHOTO OR PHOTO MULTIPLIER CELL
VIDEO AMPLIFIER
VERTICAL DEFLECTION PLATES
HORIZONTAL DEFLECTION PLATES
CRT₂
50 C/S
A C

A microphotometer comprises a spectrum plate scanned by means of the image of a cathode ray spot deflected horizontally by a low frequency linear or sinusoidal voltage, and a photo cell or a photomultiplier cell for receiving the cathode ray spot light transmitted by the plate and for deflecting the beam vertically in another cathode ray tube through a high-gain video-amplifier.

Cathode ray tube CRT_1 has its cathode ray spot focussed into a bright and sharp point, its horizontal deflecting plates being applied with a voltage from a 50 C/S A.C. mains. A sharp optical image of the oscillating spot is focussed on the spectrum plate to be examined by a cameral lens L_1 in such a way that the motion of the spot is across the spectral lines. On the other side of the spectrum plate is another lens L_2 which collects the light transmitted by the spectrum plate and condenses it on either a vacuum photo cell or photomultiplier cell. The photomultiplier output is fed to a high gain, wide-faced video-amplifier with a push-pull output stage feeding into the vertically deflecting plates of a cathode ray tube CRT_2.

47382. 30 May 1952: **A process for the modification of cashew nut shell liquid**—J. S. Aggarwal and H. H. Mathur, NCL [Group XI (1)].

A process for the modification of cashew nut shell liquid for use in surface coatings, baking enamels, air drying varnishes or the like consists in heating the cashew nut shell liquid at 160° to 300°C. with an accelerator comprising a salt of iron, cobalt, nickel, boron or chromium. The salt referred to is preferably the chloride, sulphate or oleate of these elements. According to one example 200 grams of commercial cashew nut shell liquid was slowly heated in the presence of 0·2% ferric oleate. Air was blown through and the temperature was maintained a 180°C. for 14 hours. 50 grams of this viscous material was dissolved in 100 c.c. of white spirit and cobalt naphthanate was added as a drier.

47401. 3 June 1952: **Chemical polishing of aluminium**—S. S. Bhatnagar and B. R. Nijhawan, NML [Group XLIII (3)].

Aluminium metal surfaces are polished by immersing the metal surfaces in an aqueous mixture of phosphoric, nitric and acetic acids. The treatment is carried out at about the boiling point of the solution and for a period of 4 minutes.

47439. 9 June 1952 : **A process for the manufacture of a mixed nitrogen-phosphorus fertilizer**—G. T. Gadre and J. Gupta, NCL [Group I(4)].

A process for manufacture of a mixed nitrogen-phosphorus fertilizer consists in reacting phosphate rock with hydrochloric acid, mixing with ammonium sulphate and curing the mixed slurry for at least three weeks to obtain a product which yields a dry, free flowing powder on grinding.

Example

100 gms. of kossier phosphate rock are mixed with 142·0 gms. of commercial hydrochloric acid of strength 27% and mechanically stirred. To the slurry obtained are added 70 gms. of ammonium sulphate and the mass mixed well by mechanical means. The mass is then dumped for curing for three weeks. After this period a dry mass is obtained which is finally ground to a coarse powder. The product thus obtained is a dry friable powder. It contains 15% total P_2O_5 and 7·4% nitrogen.

47446. 10 June 1952 : **Improvements in or relating to exchanger from coal, peat, lignite or the like**—R. P. Puri and P. K. Banerjee, CFRI [Group II(4)].

Ion-exchanger for water-softening or the like is obtained by adding heavy tar distillates such as middle oil, creosote oil or anthracene oil to coal, peat, lignite or the like and heating the mixture to dryness prior to sulphonation.

47468. 16 June 1952 : **Resinous compositions suitable for cation exchange**—H. A. Shah and S. L. Bafna, NCL [Groups II(4) and IX(1)].

Relates to a process for the preparation of resins. It consists in reacting the sulphonic acid of a polycyclic hydrocarbon with formaldehyde or substances adapted to yield formaldehyde in presence of sulphuric acid as the condensing agent. One sulphonic acid group is introduced per mole of the polycyclic hydrocarbon and the preferred sulphonating agent is sulphuric acid. The sulphonation catalyst such as lead, manganese, silver or mercury salts are used.

47580. 4 July 1952 : **Preparation of a composite protein food**—V. Subrahmanyan, M. Swaminathan, N. V. L. Rao and S. Kuppuswami, CFTRI [Group XIV (5)].

The protein e.g., casein is treated with 1-2% its weight of sodium bicarbonate or equivalent quantities of alkalis or other salts in aqueous solution, thoroughly mixed in a mechanical mixer, spread in thin layers and dried in a blast of air at a temperature not exceeding 50°C. The material is ground in a disintegrator and screened through a sieve of 130–200 mesh per sq. inch. A portion of the fine powder is thorougly ground with calculated quantities of different mineral salts, B group vitamin and flavouring agents and this is mixed in a mechanical mixer with the bulk of the proteinate to give a composite protein food.

47597. 7 July 1952 : **A process for the preparation of basic aluminium sulphate for use as a tanning salt or in dyeing or the like**—R. Selvarangan, M. A. Ghani and B. M. Das, CLRI [Group III].

Basic aluminium sulphate of high basicity and satisfactory tanning properties is obtained by adding to a clear concentrated solution of aluminium sulphate or alum, an alkali and a stabilizing agent selected from the group consisting of aliphatic organic acids, their salts and glycerine. Examples of alkalies are sodium carbonate, caustic soda, lime and calcium carbonate. The reaction is carried out at a temperature not exceeding 100°C.

47766. 28 July 1952: **Cation exchangers**—S. L. Bafna and H. A. Shah, NCL [Groups II(4) and IX(1)].

Relates to a process for the preparation of cation exchange resins. It consists in adding to bhilawan nut (marking nut or semecarpus anacardium) shell liquid a resinifying or gelling agent such as sulphuric acid or formaldehyde, heating the gel thus obtained at 90°C to 165°C for 18 to 96 hours and imparting cation exchange capacity to the insoluble and infusible polymer thus obtained by treating it with strong sulphonating agent such as chlorosulphonic acid, oleum. The sulphonation is carried out in a solvent such as carbon tetrachloride. The cation exchange resin obtained by the above process may be used in conjunction with anion exchangers either alone or in mixed bed for complete deionisation of aqueous media.

47802. 4 August 1952: **Purification and refining of non-edible, non-drying and so-called medicinal oils such as Karanja, Polang and Nageswar**—C. R. Mitra, NCL [Group XI(1)].

Relates to a process for the purification and refining of non-edible vegetable oils having disagreeable odours and tastes from the seed oil of karanja, polang and nageswar. The process comprises cold extraction of the oil at room temperature (25°–37°C) with solvents like methyl alcohol, ethyl alcohol, dilute acetone or mixtures of such solvents to obtain an extracted oil which can be further processed by deodourising, alkali refining and bleaching. The extracted oil is subjected to deodorisation treatment by alcohol vapour and steam distillation or by steam alone.

47815. 6 August 1952: **Liquid preparations such as paints or the like coating compositions**—J. W. McBain and J. B. Pande, NCL [Group XII(3)].

Process for the manufacture of paints or the like coating compositions consists in grinding the following ingredients in an edge runner:—(a) pigments comprising lithophone and whiting, (b) oil vehicle comprising double boiled linseed oil and raw linseed oil, (c) gloss varnish of alkyd type, (d) protective colloid, (e) thinner comprising mineral spirits, and (f) driers comprising 10% cobalt drier and 28% lead drier. The protective colloid consists of about 0·1% on the total weight of highly degraded natural rubber or partially polymerised rubber hydrocarbon polymer of 1000–2000 molecular weight. Examples of synthetic hydrocarbon polymers are polyisobutylene, polymethyl pentadiene and the like. When using highly degraded natural rubber, there is employed natural rubber or smoked sheet which has been masticated between two rolls at friction speed till a soft sticky mass is obtained.

47816. 6 August 1952: **Duplicating inks**—J. W. McBain and J. B. Pande, NCL [Group XLII(6)].

Duplicating inks having a protective colloid which would not impart elasticity and stringiness to the same. The invention consists in dispersing pigment in mineral oil and wherein a hydrocarbon of lower molecular weight (about 1000–2000) is employed as a protective colloid. Thus there may be used as a colloid natural rubber product obtained by lowering its molecular weight by degrading the natural polymer of rubber obtained from vegetable sources such as Hevea Brasiliensia and guayule. Other hydrocarbons suitable for use are polyisobutylene, polymethyl pentadiene or other like rubber hydrocarbons. Thus a composition of 400 parts of mineral oil of SAE viscosity 30 to 50, 10 to 40 parts of hydrocarbon polymer as defined above, 24 to 34 parts of carbon black and 1 part of blue tone may be worked on an edge runner to obtain desired consistency of the ink.

47817. 6 August 1952: **A process for the manufacture of sodium tripolyphosphate**—G. T. Gadre, M. K. Gharpurey and J. Gupta, NCL [Group III].

Relates to a process for the manufacture of sodium tripolyphosphate which consists in reacting trisodium phosphate with commercial phosphoric acid (80 to 82% of H_3 PO_4 at specific gravity 1·675) and caustic soda according to the following equation:

$$3Na_3PO_4 + 3H_3PO_4 + NaOH \\ = 2Na_5P_3O_{10} + 5H_{20}.$$

The solution obtained by mixing stoichiometric quantities of the said reactants, is dried, and the solid mass thus obtained is further heated at temperatures ranging between 400°–600°C for a minimum period of two hours. The low temperature form of sodium tripolyphosphate is obtained by heating at 400°–500°C, while high temperature form is obtained by heating at 580°–600°C. The product obtained is in the form of a fine powder.

47902. 20 August 1952: **Improvements in the preparation of groundnut milk, curd and products**—V. Subrahmanyan, M. N. Moorjani and D. S. Bhatia, CFTRI [Group XIV(5)].

Relates to a method of preparing milk, curd or like products from groundnuts which consists in recasting groundnut seeds, removing testa, breaking the kernels uniformly and making a paste e.g. by dry rolling, mixing with water and filtering to remove the suspended particles, adjusting the pH of the milk thus obtained to 6·6-6·8, deodorizing, fortifying with vitamins and minerals and homogenising the milk, which can be consumed as such or used for making curds, or the like milk products. The pH is adjusted by adding saturated lime water. The buffer salts such as calcium phosphate (tribasic) and sodium citrate are added to stabilise the milk and fortify the product. The deodorization is effected by treatment with steam under pressure and the product is homogenised by passing through a homogenizer to break up the fat globules and to colloidally disperse the added salts. To prepare curd, about 1% of invert sugar is added to the milk (alternatively the milk is treated with Taka diostase to convert its starch to reducing sugars) and the milk is seeded with a starter such as good quality ground nut curd for converting the milk to curd.

47982. 2 September 1952: **An improved process for the electrolytic production of high purity manganese dioxide**—T. Banerjee and H. K. Chakrabarti, NML [Group LVIII(5)].

Relates to a process for electrolytic production of high purity manganese dioxide. It consists in electrolysis of an aqueous solution containing manganese sulphate and sulphuric acid between antimonial lead anodes and stainless steel cathodes in a canvas diaphragm cell under the following conditions. The aqueous electrolytic solution has a concentration of manganese sulphate from 150 to 300 g/litre and sulphuric acid from 0 to 50 g/litre; the temperature of electrolyte is from 70 to 90° C, the direct current density on the anodes is from 0·75 to 1·25 amp/dm2 or 7·0 to 13·3 amp/ft^2 and the voltage across the electrodes in closed circuit is between 2·5 to 3·5 volts. An apparatus is also described in the specification.

48275. 21 October 1952: **Waterproofing of boards used for sound proofing purposes**—N. V. C. Rao and J. B. Pande, NCL [Groups VII(2) and XXIII].

A process of waterproofing boards used for sound-proofing purposes consists in dipping sound proof boards made of straw, cane waste and the like in an aqueous solution of wetting agent, drying them, thereafter dipping the boards in latex compounded with stabiliser, zinc oxide, sulphur, accelerator and antioxident, drying the dipped boards and finally vulcanizing the boards. The compounded latex may also contain plastioiser and colour. As wetting agents anionic soaps such as Aquarex D, Darvan etc., may be used.

48342. 30 October 1952: **A method for the regeneration of the spent liquid from electrolytic manganese and electrolytic manganese dioxide baths**—T. Banerjee and R. Manocha, NML [Group LVIII(5)].

A process, for the regeneration of the spent liquid from electrolytic manganese and manganese dioxide baths, consists in reacting the free sulphuric acid present in the liquid with an ignited mass obtained by igniting to completion pure solid manganous sulphate at about 750°C in this layer or in a rotary furnace. Manganese sulphate may also be used for ignition. When there is no further dissolution of the ignited mass in the spent liquor an indissolved mass consisting of pure manganese dioxide is obtained. When ignition at 750°C is complete, and there is no further evolution of oxides of sulphur, the ignited mass can approximately be represented by the formula Mn_3O_4 (i.e., $2MnO_2$). A requisite amount of the said residue is added to the spent liquor.

48385. 7 November 1952: **New method of preparation of active carbons from coals and lignites**—K. K. Roy, N. G. Basak and A. Lahiri, CFRI [Group IV(2)].

Relates to a process for the manufacture of active carbon which consists in the carbonisation of high volatile coals and lignites in presence of steam and the resultant coke or char subjected to air activation, characterised in that and wherein the flow of steam introduced from the start of the carbonisation is continued beyond 500°C till the char attains a temperature of 925±25°C.

The coal used may have 30 to 50% of volatile matter on moisture and mineral matter free basis and flow of steam is discontinued after the activation at 295°±25°C has proceeded for 30 minutes. The steam is supplied at rate of 0·6 to 1 lb/hr per lb of coal to the extent of a total of 200 to 300% of coal and air is supplied of 1·5 cu. ft. per lb. of coal.

Carbonised coal is cooled, crushed and activated by heating in a closed furnace by raising temperature to 925°C within 1 hour and maintaining that temperature for at least 3 hours.

48419. 12 November 1952: **Enamels for wire wound resistors**—A. Ram, Y. P. Varshney and S. S. Verma, CGCRI [Groups LVIII(3) and XLV(1)].

An enamel composition particularly suited for making enamel coated wire wound resistors, comprises 15 to 22% of alkalis or equally fusible compounds such as zinc oxides or fluorides 10 to 25% of boric acid, 40 to 60% of refractory oxides such as silica alumina or the like, 0 to 12% of colourants such as cobalt oxides, manganese dioxide and the like and 0 to 6% of fluorine. The articles to be coated is given a first coat and fired at a temperature not above 650°C then is given a second coat and fired at about 700°C.

48499. 26 November 1952: **A method for the utilization of manganese ore for the production of pure manganese sulphate and the regeneration of the sulphate spent liquid from electrolytic manganese and manganese dioxide baths**—T. Banerjee and B. Sen, NML [Groups III and LVIII(5)].

Relates to a process for the production of manganese salt from manganese ores which consists of digesting manganese ore with a dilute mineral acid such as dilute sulphuric acid and an organic reducing agent. The manganese ore may also be digested with spent electrolytic manganese sulphate solution containing dilute sulphuric acid and an organic reducing agent. The digestion is carried out by means of superheated steam.

48529. 2 December 1952 (ante dated to 13 February 1952): **A process for the thermal degradation of seed oil of nim (Melia azadirachta, Melia indica)**—C. R. Mitra, NCL [Group XI(1)].

A process for the utilization of the seed oil of nim (*Melia azadirachta*, *Melia indica*) consists in the thermal degradation of the oil by fractional distillation of the oil below 300°C, the lower limit of the distilling range being 150°C. As cracking agent $ZnCl_2$ can also be used. The thermal degradation products of the nim oil can be utilized in several ways, e.g., as a solvent for D.D.T. or "Gammexane", as an illuminant, as thinner for paints, varnishes or the like.

Specification Nos. 33649, 33650, and 33651 have been referred.

48530. 2 December 1952 (ante dated to 13 February 1952): **Improvements in or relating to utilization and refining of the seed oil of nim (Melia azadirachta, Melia indica)**—C. R. Mitra, NCL [Group XI(1)].

A process for the utilization and refining of the seed oil of nim (*Melia azadirachta*, *Melia indica*) consists in refining the oil by subjecting it to steam distillation or distillation in presence of alcohol vapour, after solvent extraction of the oil. According to the example, 1 litre of extracted oil was taken in a 3 litre round bottomed flask fitted with steam trap and condenser and preheated to 70°C with a reflux condenser. After closing the reflux condenser, alcohol vapour and steam was let in the flask from steam can containing dilute alcohol and the distillate collected. After separating off the aqueous layer, 10% caustic soda solution together with saturated brine solution was added to the oil. The oil was separated and treated with 1% active carbon at 80-90°C and filtered.

Specification Nos. 33649, 33650 and 33651 have been referred.

48640. 17 December 1952: **Preparation of starch from starch-bearing plant materials**—M. Damodaran and I. Babbar, NCL [Group XLII(1)].

In a process for the preparation of starch from starch bearing plant materials, starch is liberated from tubers by dissolving the cell wall substance by the use of enzymes derived from micro-organisms. Enzymes derived from Aspergillus aureus are used. The enzyme used is obtained by cultivating the micro-organism in a synthetic medium which is made up as follows :

Potassium di-hydrogen phosphate	0·1%
Ammonium sulphate	0·1%
Magnesium sulphate	0·05%
Pectin	2·0%
*p*H	3·2

The culture medium may be also one prepared from a previous batch of disintegrated starch tubers, consisting of the wash liquor used for separating starch from the fibrous residue.

48667. 20 December 1952: **Improvements in or relating to the utilization of waste mica for the manufacture of insulating bricks, slabs, tiles or the like**—A. Ram and S. B. Roy, CGCRI [Groups VII(2) and XXV(1)].

A process for the utilization of mica for the manufacture of insulating bricks, slabs, tiles or the like consists in mixing pulverised mica or micaceous minerals predominant in mica with a binder such as clay, glass, gum or the like with or without the addition of organic matter such as sawdust, rice husk or the like and moulding the product, drying it and heating it to a temperature of about 800° to not more than 1200°C. In one example light weight, porous insulating bricks are made out of a mixture of 5·7 lbs. of ground mica, 3·4 lbs. of red clay, 1 lb. of sawdust and 3-4 lbs. of water. The constituents are thoroughly mixed with the liquid for about half an hour and the mass is shaped by hand pressing in wooden moulds. The dried samples are finally fired to 1050°C.

48719. 30 December 1952 : **Preparation of fructose from Agave plant**—M. Srinivasan and J. S. Bhatia, CFTRI [Group XVII].

Fructose is prepared by isolating the soft underwood of the Agave plant (plant belonging to the family of Amaryllidae) and subjecting the underwood to acid hydrolysis.

Example

The soft underwood, after removing the corn and leaf attachments, weighed in one instance 85 lbs. After further dressing the material is weighed 56 lbs., hydrolysis and concentration resulted in about 1·2 gallons of a golden-yellow coloured, sweet syrup containing 7·6 lbs. fructose.

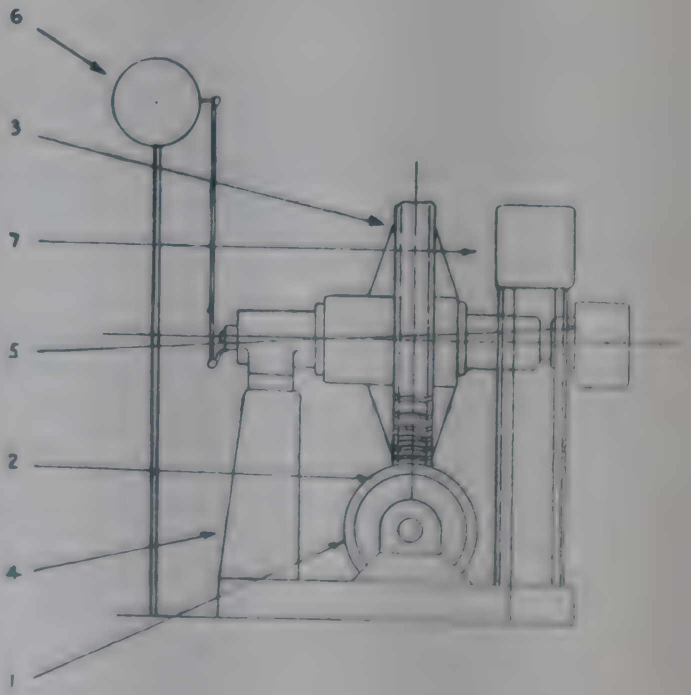
The hydrolysis consists in treatment with acid (N/5) at water bath temperatures until carbohydrates are completely hydrolysed, as determined by the total reducing sugars. The press juice of the soft underwood may also be subjected to hydrolysis to get fructose.

48873. 30 January 1953 : **Preparation of o, o-diethyl phosphoric acid ester of 4-methyl umbelliferone**—P. L. Sawhney and T. R. Seshadri, Delhi University [Group IX(1)].

O, O-diethyl phosphoric acid ester of 4-methyl umbelliferone is prepared by reacting O, O-diethyl chlorophosphate with 4-methyl umbelliferone in a solvent medium in the presence of sodium carbonate or potassium carbonate. Dry benzene, acetone or absolute alcohol may be used as the solvent.

48923. 6 February 1953 : **Production of single twisted or twin-twisted steel bars**—K. Billig, CBRI [Groups XXVI(1) and XXXV].

Relates to improvements in the production of single-twisted or twin-twisted steel bars.



The method of twisting bars held by chucks engaging the ends of the bars, consists in twisting the bars without applying axial forces so that the bars shorten during the twin-twisting process, and the bar extends during the single-twisting process.

The machine for twisting steel bars consists of a fixed end with rotating chucks (5) engaging one end of the bars to be twisted and a sliding end with stationary chucks engaging the other end of the bars which sliding end enables the steel bars to change their length during the twisting process. The fixed member consists of a supporting frame (4) carrying a motor (1), a transmission gear (2) and (3), axle and chucks (5) counter (6) and switch board (7). The sliding member consists of an A-frame (8) sliding on rails (9), chucks (5), a control (10) for the sliding movement, a control (11) for adjustment of chucks.

48934. 9 February 1953: **Improvements in or relating to the manufacture and purification of fatty acids**—K. T. Achaya, S. A. Saletore and S. H. Zaheer, RRL, Hyderabad [Group IX(1)].

A process for the manufacture of fatty acids involving the formation of urea adducts, consisting of the addition to any mixture of fatty acids of one to five times its weight of urea in saturated solution in 80% ethanol, separation of the precipitate formed thereby from the mother liquor and recovery of the fatty acids thus separated by boiling with water the precipitate and the mother liquor after removal of solvent, followed by a repetition of the process on the fractions thus obtained for preparation of purer fatty acids. Ether is added to the fatty acid mixtures when same contains large quantities of solid acids, before formation of the urea adduct.

49022. 19 February 1953: **A laext composition particularly suited for can-sealing purposes**—J. Ballabh and D. Raghunath, NCL [Group XII(1)].

A latex composition particularly suited for can-sealing purposes is composed of the following ingredients; rubber latex, casein, soluble silicate, albumen, deodorizing agent (such as capryl alcohol), bentonite, ZnO, gum, polyvinyl alcohol, toluene and turkey red oil. Ammonia preserved natural rubber latex obtained from vegetable sources is used for making the composition. An example of the composition is as follows:—

	By weights
Ammonia preserved latex 60%	100
Casein 10%	3·0
Sodium silicate	30·0
Egg-albumen (100-110 c.c. water)	30·0
Capryl alcohol (in c.c.)	5·0
Bentonite 20%	150·0
ZnO 40%	3·0
Gum tragacanth	1·0
Polyvinyl alcohol 10%	1·0
Toluene	1·2
Turkey red oil	1·2
Colour	·1

The latex composition is particularly suited for lining or seaming metallic containers which are used for storing vegetable oils.

49033. 23 February 1953: **Treatment of hides for production of gelatine or glue**—F. A. Kincl and G. V. Potnis, NCL [Group XLII(1)].

Relates to an improved method for the treatment of hides for the production of gelatine or glue which consists in treating the stock i.e. hides, hide cuttings, skins or skin cuttings with an aqueous solution of a halide salt of an alkaline earth metal or alkali metal or with a mineral acid and removing the salt or acid solution from the stock prior to liming and extraction of the gelatinous material. The alkali or alkaline earth metal used comprises sodium, potassium, calcium, barium and strontium. The mineral acid used is hydrochloric or sulphuric acid. The hides are treated with an aqueous solution (0·05 to 3·0 molar solution) of a halide salt of an alkali, alkaline earth metal or of a mineral acid for 4 to 24 hours and then liming of the pre-treated stock is done with 2–4° Bc lime slurry for a period ranging from 5 days to 2 weeks.

49054. 25 February 1953: **A process for the treatment of bamboo to further its utilization in the manufacture of pulp, paper, board or the like**—G. M. Vyas, R. V. Bhat and K. A. Chowdhury, Forest Research Institute and College [Groups XXIV(4) and XLIII(6)].

Relates to a process for the treatment of bamboo to further its utilisation in manufacture of pulp, paper, board or the like.

It consists in causing cleavage between the two main constituents of bamboo namely the fibres and parenchyma cells by mechanically disintegrating bamboo chips, splits or the like and further separating the constituents by sieving out the parenchyma cells from disintegrated mixture. The separated fibres are digested by sulphite sulphate, soda or semi-chemical methods to obtain pulps and the cells are brought to required freeness by beating. The two are mixed to obtain a high yield of pulp of about 74% yield of the original bamboo taken.

49234. 23 March 1953: **Preparation of titanium tetraiodide**—S. Ramamurthy, BHU [Group III].

Relates to a process for the preparation of titanium tetraiodide which consists in reacting titanium dioxide with aluminium triiodide.

$8\ Al\ I_3 + 6TiO_2 = 6\ Ti\ I_4 + 4\ Al_2O_3$. During the reaction between aluminium, iodine, and titanium dioxide, the lower iodides of titanium namely $Ti\ I_2$ and $Ti\ I_3$ may also be formed along with $Ti\ I_4$. The aluminium iodide required for above reaction need not be prepared separately, but may be carried simultaneously by reacting Al and I_2, which is then

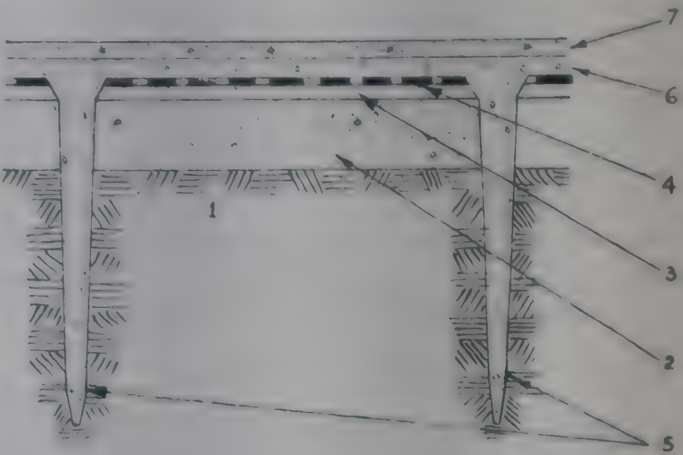
$8\ Al + I_3\ I_2 = 8\ Al\ I_3$.

reacted with TiO_2. The reaction is started by gentle warming say to about 100-125° C of the initial mixture of aluminium powder iodine and titanium dioxide, and when the reactions are somewhat subdued, strong heating up to 400°C is applied so that the titanium tetraiodide distils over into a condenser attached to the reaction vessel.

49285. 30 March 1953: **A process for the recovery of the constituent metals from copper base alloy scrap**—G. C. Mitter, S. G. Dighe and S. D. Gokhale, India Government Mint [Group XXXIII (7)].

Relates to a process for the recovery of constituent metals separately as their compounds from copper base alloy scrap. The process consists in chlorinating the scrap to turn the constituent metals into their chlorides and maintaining the temperature first in the region of lower boiling point chlorides to volatilize the lower boiling point chlorides and then raising the temperature to the region of the higher boiling chlorides until all the volatile chlorides have volatilized.

49353. 9 April 1953: **Construction of floors**—K. Billig, CBRI [Group XXVI(1)].



The invention relates to a method of construction of floors. The ground *1* is first levelled and the top layer *2* is raked loose, several inches deep. Over a thin layer *3* of sand on the layer *2* a fabric *4* of jute or hessian is stretched and fixed along its sides. A series of regularly spaced plunger piles *5* are formed over the whole area. The fabric *4* is wetted, cement grout is applied thereon and finally a layer of concrete, of say 1 inch thickness, is applied in two coats *6* and *7*. The concrete is cured and allowed to set.

After a few weeks the layer 2 of loose earth settles down so that an air space (not shown) is formed between the soil and the concrete layers *6*, *7*. The floor originally bearing directly on the ground is now suspended structure, supported solely by the plunger piles, and constituted by the thin unreinforced concrete slab spanning the piles 5 longitudinally and lateral. By providing a fine wire mesh between the two coats *6* and *7* of the concrete the resistance to cracking due to shrinkage is improved.

49355. 10 April 1953: **An improved process for the production of electrolytic manganese metal**—T. Banerjee, H. K. Charkrabarty and N. Dhananjayan, NML [Group LVIII(5)].

Relates to a process for the production of electrolytic manganese metal which consists in the electrolysis of a solution of manganese ore. The solution contains manganese

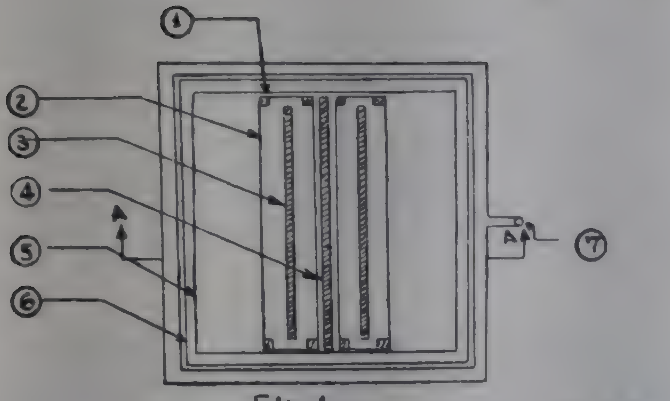
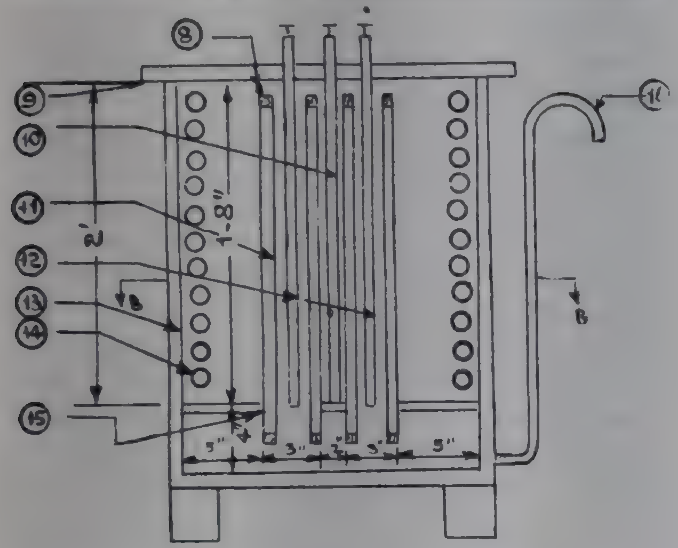


Fig. 1
SECTIONAL PLAN THROUGH "BB"



sulphate, ammonium sulphate, sulphur-dioxide and sulphuric acid in an electrolytic cell divided in cathode and anode diaphragm chambers. A flow of electrolyte from cathode to anode chambers is maintained and the catholyte temperature is best kept at 20-25°C, when a fresh cathode is inserted. Thereafter it is allowed to rise slowly and the cathode works substantially between 32-35°C till its withdrawal from the cell. The concentration of manganese sulphate is not lower than 80 gms per litre.

Figures 1 and 2 are sectional views of electrolytic cell.

49364. 13 April 1953: **The manufacture of adhesive tapes**—N. V. C. Rao, NCL [Group XXIII].

Adhesive tape for stationery purposes such as for sealing paper packages, mounting pictures on paper or the like, according to the invention, can be manufactured by applying two consecutive adhesive coats on one side of a tape made of a textile fabric, paper or cellophane, first being an anchor coat which establishes a firm bond between the second coat and the tape base wherein the first anchor coat comprises a mixture of 10 to 20% of natural rubber latex obtained from Havea brasiliensis and a bonding agent comprising 50 to 100% by weight of thermoplastic resin of the polyvinyl type or 5 to 25% by weight of a thermosetting resin prepared by condensation of polyhydric phenol with formaldehyde.

The second coat, a sticky coat comprises 5 to 25% dispersion of milled pale crepe in usual rubber solvents.

49425. 22 April 1953: **Enamels for wire wound resistors**—Y. P. Varshney and S. S. Verma, CGCRI [Groups XXXVI and LVIII(3)].

Enamels for wire wound resistors containing lead, which in addition possess necessary properties of adherence to the resistance wire and porcelain core, durability and thermal shock resistance, according to the invention, comprise 55-58% PbO, 5-8% of Al_2O_3, 10-15% of B_2O_3, 8-11% SiO_2 and 12-16% of colourants. An alternative preferred compostion may be composed of 56·7% of PbO, 6·18% of Al_2O_3, 12·37 of B_2O_3, 14·96% of Fe_2O_3 and 9·79% of SiO_2, which has a fusion point that allows the application to be fired at 600-650°C. without chipping taking palce on cooling.

Reference is made to Indian Patent No. 48419.

49441. 23 April 1953: **Improvements in the manufacture of fruit pulps in the form of sheets slabs or the like**—G. S. Siddappa and B. S. Bhatia, CFTRI [Groups XIII and XIV(5)]

Relates to a process for the manufacture of fruit pulp in the form of sheets or slabs. It consists in preparing fruit pulp or mixture of pulps and adding to it a sweetening agent such as a syrup of cane sugar. Invert sugar or glucose with or without the addition of a fruit acid and subjecting the sweetened pulp to heat treatment at 200°F to 240°F for 25 to 50 minutes. The treated material is then subjected to sieving action to separate the fine pulp from coarse-fibres and is then dried to obtain a pliable sheet which is placed on other sheets and out into slabs.

49510. 6 May 1953: **Purification and refining of non-edible, non-drying and so-called medicinal oils, such as Karanja, Polang and Nageswar**—C. Mitra, NCL.

Cognated with 47802.

49524. 11 May 1953: **Foam glass**—A. Ram and K. D. Sharma, CGCRI [Group XXXVI].

A process for the manufacture of foam glass which consists in mixing together a pulverized reducing agent and powdered glass comprising reactive oxygenated sulphur compounds other than sulphates such as sulphites, thiosulphates or dissolved gases comprising lower oxides of sulphur such as SO_2 or the like and heating the mixture in a mould to soften the glass for the reduction of the reactive constituents present in the glass by the reducing substance to produce gases, which get entrapped in, and thereby swell, the glassy mass. The reducing agent consists of pulverized carbon or carbonaceous materials such as carbon black, lamp black graphite, coke and charcoal. Other substances such as hydro-carbon, starch, sugar, cellulose may also be used. The mould is annealed in the furnace or the foamed mass is taken out of the mould and annealed.

49555. 14 May 1953: **Boron free enamels**—A. Ram, N. R. Srinivasan and S. S. Verma, CGCRI [Group XXXVI].

Boron free enamels, according to the invention, have batches for making frit comprising (a) one or more of the following refractory materials; quartz, felspar and titanium oxide; (b) one or more of the following fluxing materials:—soda ash, calcium carbonate, magnesium carbonate, sodium nitrate, fluorspar and zincoxide; and wherein a potassium compound or compounds such potassium nitrate or potassium carbonate is added to overcome defects such as hairlines and islanding caused by increase in the surface tension of the fused enamel. Process for preparing involves in (a) melting the ingredients with one or more of the following:—(i) metallic oxides such as cobalt oxide, nickel oxide or manganese oxide; (ii) opacifiers such as cryolite or antimony oxide and (iii) colourants such as copper oxide or chromium oxide and (b) milling the frit so obtained with 10 to 15% of one or more of following mill additions i.e., water clay, quartz and titanium oxide.

Thus obtained milled enamel is applied by dipping or spraying on clean iron surface to give an application weight of 20–30 grams per square foot per coat and firing at 750°–900°C.

49590. 21 May 1953: **Improvements in or relating to the manufacture of fruit juice powder**—G. S. Siddappa and Girdhari Lal, CFTRI [Group XIV(2)].

Relates to a process for the manufacture of fruit juice products which consists in concentrating fruit juice or extract, mixing it intimately with a sweetening agent like cane sugar, glucose, lactose, or the like and drying which is characterised in that before drying, the pasty mass is reduced to forms such as shreds, flakes, pellets or the like. To get the fruit juice powder, the dried product is powdered. Pulpy fruits such as mango, jack fruit, guava, papaya or the like can easily by made into such products. Salts such as carbonates, sulphites, or the like of alkali or alkaline earth metals, can be added to the fruit juices, as well as flavours, colours vitamins and acids such as citric acid, tartaric acid and the like. The acidity of the juice is suitably adjusted to a *p*H range of 4·0 to 6·0 by the addition of carbonates or bicarbonates, and then concentrated in vacuum pans at 25–27 inches vacuum at a temperature not exceeding 50°C to 80–85 per cent soluble solids.

49635. 26 May 1953: **A process for the recovery of elemental sulphur from copper pyrites**—G. C. Mitter, S. G. Dighe and S. D. Gokhale, India Government Mint [Group IV(2)].

A process for the recovery of sulphur from copper pyrites consists in reacting copper pyrites concentrate with cupric chloride. The reaction may be conducted at a temperature between 350°C and 800°C 5 parts of cupric chloride may be heated with 2 parts of the ore concentrate containing 25·8% copper, 29·7% iron, 29·9% shulphur and 7% silica. In an example a mixture of ore concentrate and cupric chloride is placed in a test tube and heated. The sulphur settled in the upper part of the tube and in the condenser is dissolved out in carbon disulphide. The cuprous chloride formed in the reaction may be electrolysed to give pure copper or converted into cupric chloride for reuse.

49729. 15 June 1953: **Improvements in or relating to the solvent extraction of coal**—A. Lahiri and A. N. Basu, CFRI [Groups IV(2), IX(1), XII(2), XII(3), XXV(2), XXVII(1) and XXXII(2)].

Relates to a process for the solvent extraction of coal and also to the preparation and manufacture of 'Coalene'—a product of solvent extraction of coal. The process consists in the extraction of coal with tar oil at a pressure of 450 to 750 psi. Various fractions of coal-tar oil (250·36°C) normally obtained from high temperature carbonisation of coal can be used. According to this procedure, coking coal with low moisture coals or Assam coals can be extracted with pitch oil, anthracene oil or creosote-oil fractions of high temperature tar. After extraction, the extract is diluted with excess solvent and then filtered. The filtrate is concentrated and added to benzene to obtain a coalene minus benzene solubles' precipitate and filtrate which on distillation yields a residue comprising benzene solubles of coalene, coal-tar oil of reuse. The 'coalene' is carbonised in the absence of air oil of reuse. The 'coalene' is carbonised in the absence of air at high temperatures and activated with steam for the preparation of ashless carbon and active carbon. In the alternative the 'coalene' is treated with oils and solvents for dispersion of the material or with protective colloids or blown with air or emulsified with water for the preparation of ion-exchange compounds.

49815. 29 June 1953: **A process for the production of improved tan liquors from vegetable tanstuffs**—Y. Nayudamma and R. Selavarangan, CLRI [Group XXIV(3)].

Improved tan liquors are prepared by soaking vegetable tanstuffs in water and leaching to obtain a tan liquor. During the leaching operation, the tan liquors are treated with oxalic acid and sodium bisulphite with or without the addition of formic acid. If desired, other ingredients like sodium hydrosulphite, aluminium sulphate and formaldehyde may also be added, the amount of each ingredient being 1–3% on the weight of tanning material. Preferably the tanstuffs should be disintegrated and the leaching done at a temperature below 100°C. The vegetable tan stuffs are of the pyrogallol type (myrobalan nuts) or of the catechol type like wattle, Babul, Karada, Avarem or Konnan bark.

49836. 2 July 1953: **Manufacture of ether**—V. V. Deshpande and N. R. Kuloor, SRIFIR [Group IX(1)].

Ether is manufactured by vapour phase catalytic dehydration of alcohol using a fluidized catalyst bed consisting of a compound of aluminium such as activated aluminium oxide, activated bauxite, or dehydrated alum at a temperature of 200–350°C. An apparatus for carrying out the process consists broadly of an alcohol boiler and fluidized bed catalyst chamber into which the vapours are passed in combination with means such as condensers or rectifying columns for separating ether, alcohol, water and ethylene, if any from the vapours coming from the catalyst chamber.

49837. 2 July 1953: **Production of pink enamels**—A. Ram, N. Srinivasan and S. S. Verma, CGCRI [Group XXXVI].

Relates to a pink enamel composition wherein manganese dioxide is used as the colourant. The limits of the enamel composition are as follows :—

	Batch composition
Quartz	5·00 – 15·00
Feldspar	35·00 to 50·00
Borax	15·00 to 25·00
Red lead	3·00 to 6·00
Sodium carbonate	3·00 to 6·00
Manganese dioxide	4·00 to 12·00

Mill addition for 100 parts of frit :

Clay	0·5–5·00
Borax	0·5
Water	40·0

The fritting temperature used is within the range of 1000°C to 1250°C.

49838. 2 July 1953: **Improvements in or relating to the roasting of cashew kernels**—M. Prasad, N. S. Kapur and P. B. Mathur, CFTRI [Groups I(3) and XIV(5)].

A process for improving the storage life of cashew kernels consists in roasting the kernels with hydrogenated groundnut oil. According to one example 5 lbs. of raw cashew kernels are placed in a rectangular metal tray and 3 oz. of hydrogenated groundnut oil are added and the tray is shaken vigorously several times. The tray is then introduced into a furnace and allowed to remain there for 20—25 minutes till the kernels have assumed a slight brownish tinge. The contents of the tray are then transferred to a bucket, 5 tea spoonful of common salt powder added and the kernels shaken thoroughly. The roasted and salted kernels are then packed in suitable cans.

49839. 2 July 1953: **A process for the preparation of concentrated food products from groundnut kernels**—B. H. Krishna and B. C. Salyan, CFTRI [Group XIV(5)].

Relates to a process for the production of a concentrated base from groundnut kernels for the preparation of food products. It consists in adding to (i) selected; cloamed and roasted groundnut kernels freed from cutlicles and hearts; (ii) groundnut or similar oil bearing material such as cashew nuts soyabeans or the like from which oil has been removed partially or completely without subjecting the material to a temperature above 50°C (to prevent dematuration of protein and instability of the resulting product) and mixing (i) and (ii) together in suitable proportions to provide a base in which proportion of protein to fat is approximately 1 to 1 or less. The mixture is further ground to smooth consistency.

49851. 6 July 1953: **Recovery of hydrochloric acid gas from unreacted chlorosulphonic acid in the manufacture of aromatic sulphonyl chlorides**—C. G. Joshi, A. B. Kulkarni and R. C. Shah, NCL [Group III].

Hydrochloric acid gas is recovered from unreacted chlorosulphonic acid in the manufacture of aromatic sulphonyl chlorides by the action of $ClSO_3H$ on aromatic compounds, by passing the reaction mixture into an acid, e.g. mineral acid, or a solution of metallic chlorides or sulphates, e.g. NaCl or Na_2SO_4 containing enough water to decomose excess $COSO_3H$ into HCl and H_2SO_4. The dry hydrochloric acid gas may be reacted with SO_3 to produce $ClSO_3H$.

Example

Toluene (100 parts) is reacted with chlorosulphonic acid (400 parts). During the reaction 39 parts of dry HCl were liberated from the portion of $ClSO_3H$ (147 p) was decomposed by pouring the reaction mixture into 33 parts of 30% aqueous HCl, cooled externally. 46 parts of HCl were again liberated. HCl gas was in both cases dried and absorbed in fuming H_2SO_4 (290 p) containing SO_3. The total weight of the resulting mixture was 375 parts which on distillation gave pure chlorosulphonic acid (250 parts).

49852. 6 July 1953: **Manufacture of azo-dyestuffs from cashewshell liquid derivatives**—V. S. Pansare and A. B. Kulkarni, NCL [Group IX (i)].

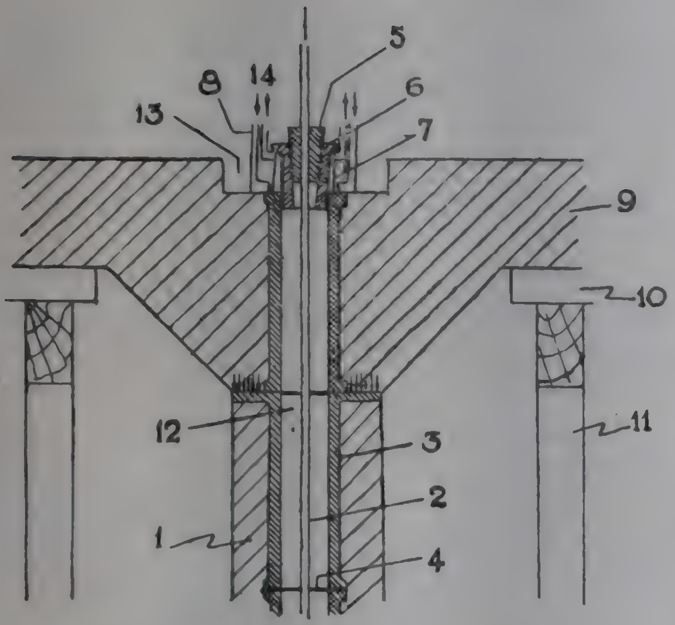
Azo-dyestuffs are manufactured by coupling a phenolic hydrogenated component of cashew shell liquid with a diazonium salt of an aromatic amine in presence of an alkali. Thus penta-decyl phenol, panta-decyl resorcinol or tetrahydroanacardic acid may be coupled with a diazotised aromatic amine. The aromatic amines that may be used are, for example, aniline, chloroaniline, nitroanilines, anisidines, phenetidines, toluidines, benzidines and napthyl amine.

Example

30·4 parts of 3-penta-decyl phenol were dissolved in 70 parts of alcohol. 7·5 parts of NaOH solution (10N) were added to the alcoholic solution. Diazonium solution prepared from 15·9 parts of *O*-auisidine hydrochloride and 6·9 parts of $NaNO_2$ (20% solution), was gradually added and the dye was separated by adding dilute hydrochloric acid. The dye was crystallised from 70% alcohol to yield a product melting at 98-99°C.

49880. 10 July 1953: **Improvements in and relating to the manufacture of pre-stressed concrete**—K. Billig, CBRI [Group XXVI(i)].

The invention relates to a method of constructing a prestressed structure of concrete or like building material. The steel members of the structure are initially precompressed by removable cables; at a later



stage this precompression is replaced by the dead weight of the structure and the permanent load to be carried. The steel members will always be stressed in compression and the concrete is not essentially stressed at all under the effect of dead weight and permanent loads.

In the construction of an axially loaded column (fig. i) for carrying a concrete floor, the steel strut *3* is precompressed by a pretensioned steel cable 2 held in the stretched position by a locking device comprising weldges 5, sliding collars *6* and distance pieces *7* provided at both ends. The member *2-7* is embedded in the concrete column; after the concrete is hardened the locking device at the top is removed by a hydraulic jack *8* and the cable *2* released. The pressure applied to the jack *8* to take over the reaction to the pre-stressing force is then gradually released. The steel strut *3* expands slightly thereby raising the newly constructed floor *9* from the framework *10* and scaffolding 11. The dead weight of the floor *9* is now, transferred to the column and the precompression in the strut *3* is replaced by the dead weight. The slight expansion of the strut *3* is transferred by bond to the surrounding concrete 1 which is pre-tensioned. The hollow space 12 and the recess 13 are finally filled with cement mortar or concrete.

The dead weight of the superstructure and the permanent loads are carried solely by the steel members; the strains in the concrete will be round about zero or tensile and of low value. The concrete will be strained only by the application of line loads and concrete stresses will oscillate around the zero value. Piers, walls, arches, compression booms struts and similar structures carrying mainly compression loads can be constructed by this method.

Structures subjected to bending or both compressive and tensile loads are provided with steel members in the tensile zone initially pretensioned in the known manner and with steel members in the compressive zone precompressed according to this invention.

50067. 12 August 1953: **Synthetic tanning materials (syntans) for making leather**—D. Mukherji and B. M. Das, CLRI [Group XXIV(3)].

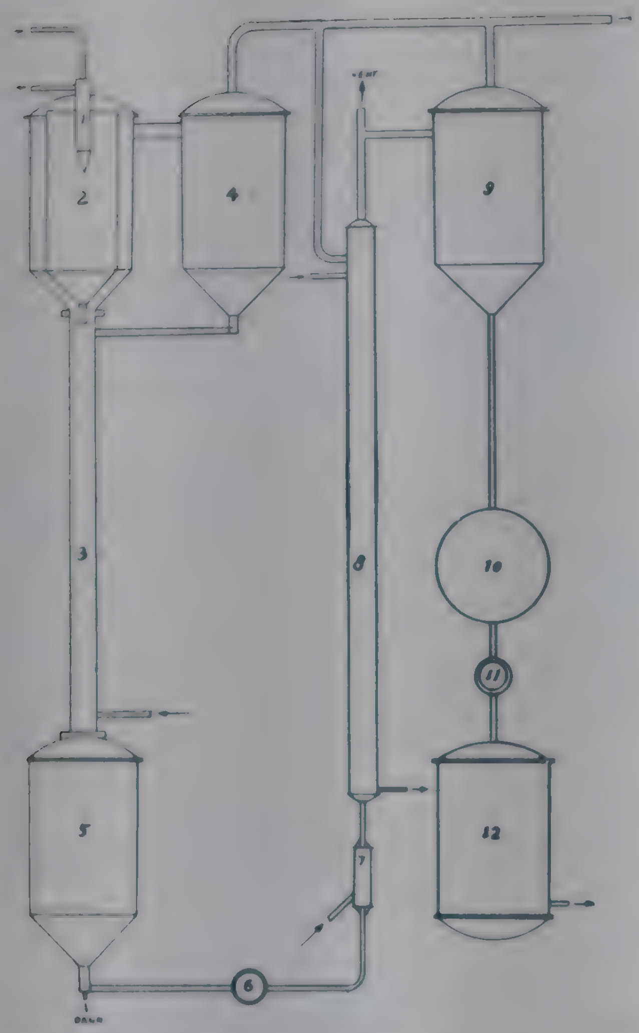
Synthetic tanning material for making leather is prepared by a process which consists in melting colophony by heat and mixing with phenols or cresols, adding formaldehyde to condense the materials, sulphonating the condensed products, washing and bringing the product to a pH of 8·2 to 8·5.

Example

A mixture of 100 gms. each of commercial resin and cresols was heated to 85° to 90° and stirred. Then 48 gms. of 40 per cent formaldehyde and 1 c.c. of 98 per cent sulphuric acid diluted with 20 c.c. of water were added. Condensation was done for 4 hours with constant stirring at a temperature of 85° to 90°C on a water-bath. The condensed mass was sulphonated. Sulphonation was done by adding 80 gms. of concentrated sulphuric acid to the condensed mass vary slowly maintaining the temperature between 90° and 95°C. After sulphonation, the mass was washed with hot water. The sulphonated mass was dissolved to a thick solution. The solution was cooled and standardised to a pH 8·5 by adding to the solution the required quantity of 10 per cent caustic soda solution.

50122. 28 August 1953: **Process for the deodorization and recovery of volatile principles from substances such as food materials**—B. H. Krishna, S. K. S. Lakshmi Narayanan, CFTRI [Group XIV (5)].

A process for the deodorisation or recovery of volatile principles form odoriferous



substances such as foodstuffs which consists in atomising suitably diluted odoriferous substance by means of high (50–60 lb) pressure steam and a jet. The odoriferous substance treated can stand a temperature of about 140–150°C for 1–1·5 sec. without deterioration.

An apparatus for carrying out the process comprises a steam jet for atomising the suitably diluted substance to a fine spray, a container into which the liquid is atomised a packed or bubble plate column down which the sprayed liquid runs, a steam injector at the lower end of the column for the injection of a rising current of steam to meet the descending sprayed liquid and a tank fitted under the column to collect the descending liquid. A steam injector is connected to the tank into which steam injector the liquid from the tank is pumped and an evaporator element is fixed at the top of the steam injector into which evaporator element a mixture of the liquid and steam under pressure is flashed for further removal of the odorous principles. A separator is connected to the top of the column for the removal of entrained liquid from the vapour. Vapour holding volatile flavours is condensed for the recovery of the said flavours. The material treated consists of an homogenised emulsion of thinned groundnut paste the *p*H of which is raised to 7–7·4.

50173. 29 August 1953: **A process for the utilization of low grade coal in cement manufacture**—J. W. Whitaker, CFRI [Group XXV(2)].

A process for the utilization of coal in the manufacture of cement which consists in feeding a ground mixture of limestone and coal in the form of a slurry if desired to a kiln and firing with more ground coal or other like fuel. Low grade coal having ash percentage from 25 to 50 per cent or more can be utilized without any addition of clay. A small quantity of wetting agent may be added where necessary to get a homogeneous mixture. The ash of the coal has essentially the right amount of silica and alumina to balance the lime from the limestone and to give a cement of the right composition 100 tons of limestone of moderately pure quality burned with a total amount of 100 tons of coal with about 33 per cent ash gives a cement which fulfils British standards.

50339. 25 September 1953: **Manufacture of physiologically active compounds from Cissampelos pareira Linn. (Menispermaceae)**—S. Bhattacherji, V. N. Sharma and M. L. Dhar, CDRI [Group IX(1)].

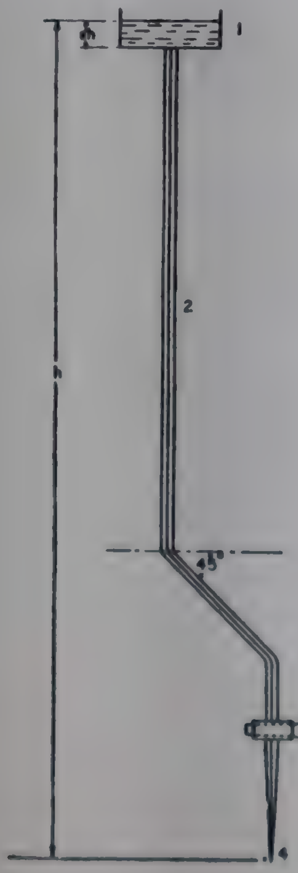
A process for the manufacture of physiologically active substance from hayatin or from the total alkaloidal constituents of *Cissampelos pareira* Linn. (Menispermaceae) containing hayatin, consists in reacting the said alkaloid hayatin, or the crude mixture of alkaloids containing hayatin, obtained from *Cissampelos* pareira Linn (as described in specification No. 50340), with organic halogen or sulphur compounds, in presence of or without an organic solvent (as diluent) and acidic materials (such as hydrochloric acid, acetic acid or the like) or alkaline materials (such as sodium hydroxide potassium hydroxide or the like).

Hayatin is an alkaloidal constituent, m.p. 303° (decomp.), optically active, with a provisional formula $C_{35}H_{36}N_2O_6$. or $C_{36}H_{38}N_2O_6$.

50340. 25 September 1953 : **Isolation of a new alkaloidal constituent from Cissampelos pareira Linn, (Menispermaceae)**—S. Bhattacherji, V. N. Sharma and M. L. Dhar, CDRI [Group IX (i)].

A process for the isolation of an alkaloidal constituent, hayatin, consists in extracting the plant *Cissampelos pariera* Linn. (menispermaceæ) with water or an organic polar solvent such as alcohol, aryl or isoamyl alcohol, methyl alcohol, butyl alcohol, dioxane, pyridine or the like, precipitating the total alkaloids from the extract by the addition of alkali, alkali carbonate or bicarbonate, or ammonia, and removing subsidiary alkaloidal constituents comprising bebeerine from the precipitate by extracting with a solvent such as ether, chloroform, ethyl acetate or the like in which hayatin is sparingly soluble and bebeerine is easily soluble. The crude hayatin thus obtained is purified by dissolving in acidified organic solvents and neutralising the solution with alkaline materials.

50483. 19 October 1953 : **Soft iodobromide positive emulsions**—D. Chatterjee and J. S. Gujral, NCL [Group XXXVIII(3)].



A process for the preparation of soft iodobromide positive emulsions which consists in preparing an emulsion comprising a suspension in gelatine of silver halides and wherein the gelatine is subjected to washing followed by swelling for 4-5 hr. in a 0·5–0·6% potassium bromide solution at 25–28°C before emulsification. Indigenous gelatine is used. Gelatine is swelled in 0·5% potassium bromide solution for 4-5 hr. and then ammonium bromide, potassium bromide and potassium iodide are added to it before emulsification. The emulsification is done by the controlled addition (10 c.c. per min) of a mixture of silver nitrate and ammonium nitrate solution to gelatine to which halides have been added. A few drops of ammonia (sp. gr. 0·910) are added (to the halided gelatine rather than to the silver nitrate solution) before emulsification. The resulting emulsion noodles are washed with water to which a salt with a bivalent cation, such as cadmium bromide, has been added. Continuously running chilled tap-water (8–10°C) containing a trace of cadmium bromide is used. An artificial sensitizer, such as thiourea, is added to the washed emulsion and it is digested at a temperature near 58±2°C for 60–75 min. 1/55,000–1/38,000 of the total weight of the gelatine used in the emulsion of M/100 (aqueous solution) thiourea is added as the sensitizer. Potassium bromide (0·03 g. per 100 g. of washed noodles) is incorporated into the emulsion by adding to the said emulsion gelatine which has been swelled in 0·1% potassium bromide solution. A hardener solution containing 11–14% chrome alum and 0·7–0·8% citric acid is added to the emulsion prior to coating paper with it. 2–2·5 c.c. of the hardener solution is added to every 100 c.c. of the digested emulsion. The fast iodo-bromide positive emulsion obtained is coated on paper (pre-coated with baryta) at 30°C, the coated papers are chilled and then dried at 25–28°C in complete darkness.

50574. 29 October 1953 : **A magnetic fluid for crack detection**—K. C. Srivastava, NPL [Group LVII(1)].

A process for the manufacture of a magnetic fluid for the detection of cracks, discontinuities and inclusions or similar faults in materials which consists in suspending in a mineral oil vehicle of density between

0·78—0·85 g. per c.c. a very finely ground (300 mesh or smaller size) magnetic material (other than iron filings) from which non-magnetic materials have been removed. Crushed magnetite ore of less than 300 mesh size from which non-magnetic materials have been removed is used. Electrolytic iron powder of less than 300 mesh size is used. A mineral oil vehicle such as white spirit, high-speed diesel engine oil, furnace oil or kerosene distilled between 180-260°C. is used. The solid content of the suspension is 1—1·5% by weight. Oleic acid with or without the addition of aluminium stearate, zinc stearate or calcium oleate is also added to the fluid.

50758. 3 December 1953 : **A process for the preparation of modified alkyd resins**—J. S. Aggarwal and P. G. Sharma, NCL [Group IX (1)].

A process for the preparation of modified alkyd resin suitable for use in the manufacture of coating compositions which consists in heating polybasic acids (or their anhydrides), polyhydric alcohols, and fatty acids of petrol ether extracted kamala oil in an atmosphere of inert gas up to a temperature of 230-250°C. till the acid value is less than ten. Kamala oil fatty acids are partly replaced by fatty acids of other drying oils such as linseed, tobacco seed, safflower seed or the like oils. The fatty acids are heated with polyhydric alcohols and polybasic acids (or their anhydrides) at 180-190°C. for 2 hr. and fatty acids derived from petrol ether extracted kamala oil are then added and heated to 230-250°C. till the acid value is less than 10. The modified alkyd resin is thinned with xylene, xylene-toluene mixture or solvent naphtha and a drier comprising a cobalt salt solution or a cobalt and manganese salt mixture.

50782. 7 December 1953 : **Improvements in or relating to tanning liquors**—R. Selvarangan, M. A. Ghani and B.M. Das, CLRI [Group XXIV(3)].

A process for the preparation of a tanning liquor consists in reducing a bichromate with a metal like aluminium or iron in presence of an acid such as sulphuric acid or hydrochloric acid. The resulting normal salt mixture of chromium and aluminium sulphate is then mixed with masking agents like hydroxy organic acids, mild oxidation products of aldoses like glucose, acid-hydrolysed cane sugar or molasses or a mixture of these products. A combination of citric acid and formic acid is a suitable masking agent. The salt solutions are then made basic to the desired degree of basicity by the addition of an alkali. If desired sodium chloride may be used as a catalyst for the reduction reaction.

50803. 9 December 1953 : **Synthetic tanning materials**—N. Viswanathan and B. M. Das, CLRI. [Group XXIV(3)].

Synthetic tanning materials from "Novolaks" (acid catalysed phenol-formaldehyde condensation products) can be prepared, according to the invention, by condensing phenol with formaldehyde, sulphonating the condensed product and reducing the sulphonated product with a metal (capable of reacting in an alkaline medium producing hydrogen) in an alkaline medium or with sod. amalgam and water.

The sulphonation of the condensation product may be done with strong (93-100%) sulphuric acid, oleum or chloro sulphonic acid, while as a reducing agent there may be used zinc dust or granules, aluminium dust or foil in alkaline medium. The resulting product is extracted with ethylalcohol and methyl-alcohol successively to remove salts of the type of sodium sulphate and alcohol is then removed by vacuum distillation for repeated use.

50804. 9 December 1953 : **Synthetic tanning materials**—N. Viswanathan, and B. M. Das, CLRI [Group XXIV(3)].

Synthetic tanning materials from sulphonated phenol-aldehyde condensation products, according to the invention, can be prepared by condensing phenol with formaldehyde sulphonating the condensed product, dehydrating and acetylating the product thus obtained with acetic anhydride, treating the reaction product first with saturated solution of sodium sulphite and then with solid sodium sulphite, removing the salts of the type of sodium sulphate and sodium sulphite by extracting the reaction product with ethyl alcohol and methyl alcohol successively. The alcohol may be recovered by a vacuum distillation for reuse. The dehydration of the condensation product of phenol and formaldehyde may be effected by vacuum drying and sulphonation effected by addition of H_2SO_4.

50805. 9 December 1953 : **A new fruit product**—N. L. Jain, D. P. Das and G. S. Siddappa, CFTRI [Group XIV(5)].

A hardened confection with a toffee texture comprises fruit pulp, reducing and non-reducing sugar, milk solids and edible fat. The process for making the fruit product comprises in mixing the ingredients, evaporating the mass by heating, and cutting into toffees the product which sets on cooling. The fruit pulp may be concentrated to a half or third of its initial volume, the remaining ingredients added and the entire mass evaporated by heating to a temperature which at the final stage ranges from 240°—280°F. Fruit pulps of bannana, jack fruit, guava, papaya or mango may be emloyed for making the fruit product. After evaporation the hot mass is transferred to a smooth hard level surface and the product is spread into a thin sheet of any desired length and allowed to cool. The solid sheet is then cut into toffees of desired shape.

50806. 9 December 1953 : **An improved process for the enzymic unhairing of skins and hides**—S. Bose, W. M. Krishna and B. M. Das, CLRI [Group XXIV(3)].

A process of the enzymic unhairing of skins or hides for the manufacture of glove leather, glace kid, box sides, East Indian tanned kips and skins, sole leather or the like consists in immersing soaked and drained skins or hides in an unhairing bath comprising a mixture of madder latex, common salt and water at pH of about 3·5 to about 8·5 for unhairing and bating of the skins or hides within a period of about 20—24 hours. The skins may then be pickled to be chrome tanned or pickled or dipickled if they are to be vegetable tanned. The example below describes the way in which a type of leather is produced.

East Indian Tanned kips :—

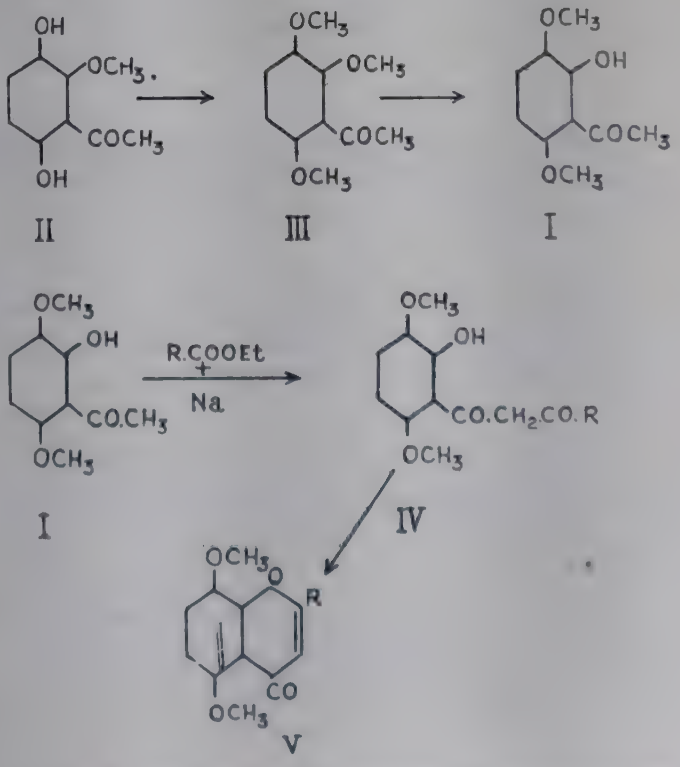
Cow hides after being unhaired by the above process are washed well and handled for some time in 3·0% "Basintan" (Auxiliary syntan for protanning) solution based on the pelt weight and left overnight in this liquor. Next day they are beamed well on the flesh side and put in the bark liquor along with syntan liquor and the bark tanning and finishing processes are followed in the usual manner.

50863. 16 December 1953 : **Synthetic tanning material**—B. M. Das and D. Mukherjee, CLRI [Group XXIV (3)].

Synthetic tanning materials are prepared by the hydroxylation of sulphonated and condensed phenolic coal-tar distillation products. The hydroxylation is effected with condensed resorcinol by mixing condensed cresol or phenol sulphonic acid and condensed resorcinol and heating for 8 hours at 100°C. The hydroxylated products are further condensed with urea and acetone and the product is standardised to a *p*H of 3·2 to 3·5. The phenolic coal-tar distillation products may consists of phenols, cresols or the like.

Cresols or phenols are first sulphonated with H_2SO_4 and then condensed with formaldehyde. Thereafter the sulphonated products are condensed with formaldehyde and then hydroxylated with condensed resorcinol. The resorcinol is previously condensed with formaldehyde.

50864. 17 December 1953 : **Preparation of 2-hydroxy-3·6-dimethoxy acetophenone**—T. R. Seshadri and S. K. Mukherjee, Delhi University, Delhi [Group IX(1)].



2, 5-Dihydroxy-6 methoxy acetophenone is fully methylated to the tri-methoxy ketone and the product partially demethylated with aluminium chloride in ether to yield 2-hydroxy-3, 6-dimethoxy acetophenone which is suitable for use in the preparation of 2-alkyl-5, 8-dimethoxy chromones. The chromones have "Kellin"-like activity and are useful in the treatment of lucoderma, spasmodic conditions like asthma and intestinal colic and for ailments of the heart.

Example

To a solution of 2, 5-dihydroxy-6-methoxy-acetophenone (5·3 g) in dry acetone (200 c.c.), dimethyl sulphate (8·5 c.c.) and anhydrous K_2CO_3 (30 g) were added and the mixture refluxed for 15 hours. 2, 3, 6-trimethoxy acetophenone (yield 4·8 g) is obtained on working up the reaction mixture. It crystallises from petroleum ether as silky needles.

To a solution of anhydrous $AlCl_3$ (11·4 g) in dry ether (50 c.c.) cooled to 0°C was added slowly a solution of 2, 3, 6-trimethoxy acetophenone (6 g) in dry ether (50 c.c.), the mixture being agitated during addition. The mixture was allowed to stand for 48 hours and subsequently worked up. A brown oil which can be crystallised from petroleum ether is obtained, the yield being 4·75 g.

50872. 17 December 1953 : **Process for the manufacture of tanned skins**—R. Selvarangan and B. M. Das, CLRI.

50873. 17 December 1953 : **Manufacture of basic aluminium chloride**—R. Selvarangan and B. M. Das, CLRI.

50874. 17 December 1953 : **Manufacture of upholstery leathers**—R. Selvarangan and B. M. Das, CLRI.

50926. 26 December 1953 : **Manufacture of nicotinic acid**—G. D. Shah and R. C. Shah, NCL [Group **IX**(I)].

Nicotinic acid is prepared by oxidising nicotonic or nicotine sulphate using pure, recovered for regenerated oxides of manganese or pyrolusite ore and dilute sulphuric acid. The nicotinic acid is isolated as copper nicotinate by use of oxide or salts of copper, which are recovered as copper oxide and reused.

Example

Sufficiently fine pyrolusite ore (150 gms) was suspended in dilute sulphuric acid (500 c.c. 35–40% by weight) and warmed to 95–130°C on an oil bath. Nicotine sulphate (50 gms. 40% nicotine content) is added slowly in small lots allowing the reaction not to be too rigorous. After the addition was complete the reaction mixture was further heated for about 4 hours. It was then cooled, filtered and the residue washed with warm water and washings mixed with the filtrate. From this filtrate nicotinic acid is recovered using copper sulphate to precipitate nicotinic acid as copper nicotinate and isolating nicotinic acid from the copper nicotinate.

51026. 11 January 1954 : **Improvements in or relating to reinforced concrete structure**—K. Billig, CBRI.

51084. 18 January 1954 : **Improvements in or relating to reinforced concrete construction**—K. Billig, CBRI.

51189. 3 February 1954 : **Preparation of calcium gluconate by the electrolytic oxidation of glucose**—B. B. Dey, H. V. Udupa and V. S. Menon, CECRI [Group LVIII(5)].

Relates to a process for the preparation of calcium gluconate. It consists in electrolytic oxidation of glucose to gluconic acid in the presence of alkali bromide as electrolyte and the subsequent reaction of gluconic acid with added calcium carbonate or lime to give calcium gluconate. According to the invention, the cell in which the electrolytic oxidation is carried out is provided with a rotating graphite anode. In carrying out the process preferably a 2% alkali bromide solution is used for a mole of glucose per litre in solution [illegible] temperature of 35°C is maintained. The current density is between 2 to 28 amps/dm^2.

51201. 5 February 1954 : **Manufacture of picking band leather**—R. Selvarangan and B. M. Das, CLRI [Group XXIV(3)].

A process for the manufacture of picking band leather consists in subjecting pelts prepared for tanning (by soaking, liming and deliming) to a combination alum-oil-vegetable or vegetable-alum-oil tannage. The pelts are subjected to a pre-tanning treatment with formaldehyde and/or acid and salt picking and/or acid 'Calgon' treatment.

51250. 13 February 1954 : **A process for the manufacture of chrome vegetable tanning extract**—Y. Nayudamma and T. S. Ranganathan, CLRI [Group XXIV(3)].

A chrome-vegetable tanning agent is prepared by reducing a mixture of sodium dichromate and sulphuric acid by vegetable tanning materials like divi-divi, myrobalan, wattle or the like.

By way of Example

100 gms. of $Na_2Cr_2O_7$ is dissolved in 250 c.c. of water and 35–100 gms. of powdered tanning material is added and stirred when 84 gms. of H_2SO_4 are slowly added with constant stirring. The reduction is complete within 2 hours. The liquor is cooled and filtered. The liquor can be used as such for tanning purposes as the basic chromium liquor is used in chrome tanning. The liquor can also be prepared in powder form by spray drying. The tanning extract can be used for tanning glace kid, suede leather and roller skins.

51524. 18 March 1954: **Improvements in or relating to the electroplating of metals on aluminium or its alloys**—T. Banerjee and D. S. Tandon, NML [Group LVIII (5)].

Relates to a process for electroplating of metals on aluminium or aluminium alloy. It consists in providing aluminium or aluminium alloy with coating of iron by dipping it in an acidic solution of ferric chloride and electroplating the iron coated article with nickel or nickel and chromium. The aluminium article before coating with iron is degreased by it in a mild alkaline cleaner for 6 to 8 minutes at a temperature of 85 to 90°C followed by washing in cold running water at 25–30°C where it is kept immersed. The article may also be etched by a dilute solution of hydrofluoric acid.

51525. 18 March 1954 : **A process for the preparation of a malt food**—M. R. Chandrasekhara, M. Swaminathan and V. Subrahmanyan, CFTRI [Group XIV (5)].

To obtain at a low cost a highly nutritious malt food, according to the invention, malted cereal flours are mixed with groundnut flour and skimmed milk powder. The composition may be fortified with vitamins and minerals and may also comprise disodium phosphate, potassium phosphate, glycerophosphates of sodium and potassium, sodium citrate, sodium chloride as buffering salt.

Thus malted grain like chelem, ragior wheat is dehusked and finely ground to pass through 100 mesh sieve. Similarly groundnut kernels are cleared, roasted and lighted for 10 to 15 minutes, red skin removed, pressed in an expeller to remove oil and cake obtained powdered to prepare groundnut flour. The two flours are then mixed with roasted pulse flours, skimmed milk powder and powdered sugar in suitable proportions.

51575. 27 March 1954 : **A process for treatment of the agave plant**—M. Srinivasan, I. S. Bhatia, B. H. Krishna and S. K. Lakshminarayana, CFTRI [Group IV(I) and XVII)].

Relates to a process for the treatment of Agave Plant for the preparation of fructose. It consists in repeated extraction of the soft underwood of the plant with hot water (85 to 98°C) to obtain an extract containing all the water soluble material such as polyfructosans and simple sugars. The underwood may be in wet or dry condition. The extract is hydrolysed with a dilute acid in an autoclave. The hydrolysed juice is concentrated at a reduced pressure to obtain a thick syrup containing 80–85% fructose weight by weight.

Reference is made to Indian Specification No. 48719.

51625. 5 April 1954: **A process for the concentration of manganese ores high in iron**—G. V. Subramanya Iyer and P. I. A. Narayanan, NML [Group XXXIII (6) and XXXIII (8).

A process for the concentration of manganese ore high in iron consists in the magnetic separation of manganese minerals like pyrolusite, braunite and psilomelene from feebly magnetic minerals like hematite, quartz, clay and wherein the ore is deslimed prior to magnetic separation of the minerals. The magnetic separation can be effected in any type of high intensity magnetic separator, for instance, one which makes two products in one pass or in a separator which yields many products, each of a definite magnetic susceptibility, in a single pass. The ore either before or after comminution is subjected to washing with water with or without deflocculating or cleansing agents like soda ash, sodium silicate, starch and tannic acid.

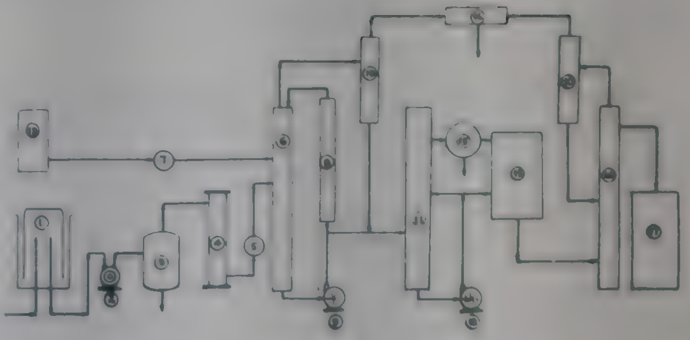
51816. 4 May 1954: **Recovery of fatty acids from cotton seed oil refining foots**—K. T. Achaya, S. A. Saletore and S. A. Zaheer, RRL, Hyderabad [Group IX(1)].

Fatty acids are recovered from oil foots in crude form by saponification or by autoclaving with excess water and the so-obtained crude fatty acid mass is mixed with urea or thiourea. The urea-fatty acid complex is separated as a solid adduct and light-coloured fatty acids are regenerated from said adduct by the addition of water. To the crude fatty acids, urea or thiourea is added, dissolved in ethanol, and the whole mass is refluxed for about an hour and then allowed to cool. The solid adduct obtained is washed with ethanol and boiled with water when the fatty acids separate out.

51847. 10 May 1954: **A process for the manufacture of copper ruby glass**—A. Ram, S. N. Prasad and P. V. K. Vaish, CGCRI [Group XXXV(I)].

Wherein copper compound is reduced to the metallic stage and silicon is used as a reducing agent.

51958. 22 May 1954: **Manufacture of ethylene dichloride**—R. K. Bhatnagar, N. R. Kuloor and D. N. Daruvalla, SRIFIR [Group IX(I)].



Relates to a process for the manufacture of ethylene dichloride which consists in passing ethylene and chlorine and under normal atmospheric or higher pressure in a vertical tube reactor, wherein a stream of cooled ethylene dichloride is showered from the top. It is preferred to have a minimum pressure in the reactor of 5 to 10 lbs per square inch. The ethylene dichloride is cooled to 80-90°F prior to reaction. Preferably the vertical tube reactor is filled with raschig's rings or cut glass pieces or similar packing material. The reaction may be promoted by dissolving a fourth group element like anhydrous ferric chloride, aluminium chloride or the like in the circulating ethylene dichloride. The preferred concentrations of ferric chloride are 0·01 to 0·1%. The ethylene dichloride showered from the top along with the ethylene dichloride formed flows out of the reactor where a portion of it is continuously or periodically removed. The unremoved ethylene dichloride is cooled and pumped to the top of the reactor.

52003. 26 May 1954: **Improvements in or relating to the preparation of quinoline compounds**—U. P. Basu, Bengal Immunity [Group IX(I)].

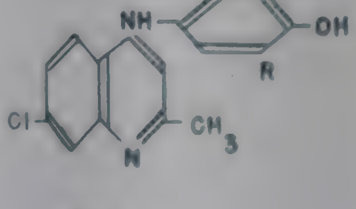


Fig 1

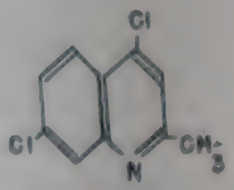


Fig 2

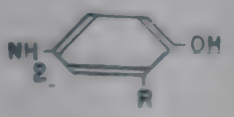


Fig 3

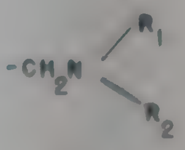


Fig 1a

Quinoline derivatives of the formula represented by Fig. 1 wherein R is hydrogen or a group represented by $-CH_2N(R_1R_2)$ wherein R_1 and R_2 are either alkyl groups or may form a heterocylic ring, are prepared by reacting a substituted or unsubstituted p-aminophenol with 4, 7-dichloro-2-methyl. quinoline.

Example

To a solution of 4·85 g of p-aminophenol hydrochloride in 50 c.c. of water, 7 g. of 4, 7-dichloro-2-methyl quinoline were added and the mixture was heated on a steam bath for 4 hours and then allowed to stand for 2 days. The crystalline solid was collected and stirred with an excess of concentrated ammonia. The product was crystallised from rectified spirit. 7-chloro-4-(4'hydroxy anilino)-2-methyl quinoline thus obtained melts at 274-275° C.

Reference has been made to Indian Patent No. 39204.

52013. 27 May 1954: **A process of enzymic unhairing of skins and hides**—S. Bose, W. M. Krishna and B. M. Das, CLRI [Group XXXIV(3)].

Relates to a process for enzymic unhairing and bating for the manufacture of leather such as glove leather, glace kid, box sides, East Indian tanned kips and skins, sole leather or the like which consists in unhairing and bating the skins of hides by immersing them in the water extract of enzymes from germinated ragi (Eleusine coracana). The skins or hides are unhaired and bated by immersing them for 3 to 4 days in the water extract of the enzymes and common salt at *p*H 4·5. The amount of common salt used is 5·0% on the soaked drained weight of skins or hides. The pH of the unhairing and bating liquor is adjusted to 4·5 by addition of acetic acid. The time required is about 3-4 days at a room temperature of 26-32°C, and the time required varies inversely with the atmospheric temperature. The enzyme extract from 1 lb. of dry ragi is used for unhairing and bating about 4-5 lbs. of soaked drained weight of skins and hides. The ragi is a cheap millet abundantly cultivated in the states of Mysore, Madras, Hyderabad and Bombay.

52014. 27 May 1954: **Preparation of halogenated rubber**—C. S. Ramakrishnan and D. Raghunath, NCL [Group XII(1).]

Relates to a process for the preparation of halogenated rubber which consists in the electrolysis of aqueous hydrochloric acid or other halogen acid in the presence of stabilised rubber latex for the liberation of chlorine or other halogens in situ which react with rubber and yield halogenated rubber. Alternatively the rubber latex is fed with dry hydrogen chloride gas or other halogen acid gas and resulting mixture is subjected to the action of an electric current to liberate the halogen. The product is further chlorinated by suspending it in a solution of chlorine in carbon tetrachloride and exposing it to sunlight or by suspending it in carbon tetrachloride & passing chlorine gas into the system and simultaneously irradiating the same. The latex stabilised by the addition of a stabiliser consisting of a non-ionogenic soap or cationic soap. An aqueous solution of a metallic halide such as sodium chloride, bromide or the like may also be used. The electrolysis is carried out at a voltage upto and below 4 volts preferably between 1·3 and 1·4 volts and the reaction is carried out between 5°—60°C.

52027. 29 May 1954: **Composition for preparing cylindrical rolls from washed safety base cinematographic films**—K. G. Mathur and A. M. Lele, NCL [Group XII(2)].

A composition for preparing cylindrical rolls from washed acetate base cinematographic films is composed of an active solvent for softening the surface of the film and a binder for binding the film layers into a compact and homogeneous cylindrical roll, wherein the active solvent consists of dioxane.

The binder may consist of cellulose nitrate solution in acetone together with glacial acetic acid; or the use of acetic acid is avoided by using as binder a solution of safety base film in methylene chloride and methyl alcohol.

A process for preparing the above said composition consists in preparing the following two solutions (a) and (b):—

(a)	Dioxane	50 c.c.
	Acetone	10 c.c.
	Butylacetate	15 c.c.
	Acetic acid	20 c.c.
	Toluene	5 c.c.

(b) 10 gms cellulose nitrate base film dissolved in 10 c.c. acetone, and adding 10 cc of (b) to 100 c.c. of (a).

Alternately a process for preparing the composition consists in preparing the following two solutions (a) and (b) :—

(a)	Dioxane	50 c.c.
	Acetone	20 c.c.
	Methylacetate	20 c.c.

(b) Safety base film 10 gms dissolved in a mixture containing :

Methylene chloride	70 c.c.
Methyl alcohol	30 c.c.

and adding 10 c.c. of (b) to 90 c.c. of (a). Cylindrical rolls made by this composition can be used in the manufacture of bangles, toys or like plastic articles.

52028. 29 May 1954 : **A cement composition for jointing safety base cinematographic films**—K. G. Mathur and A. M. Lele, NCL [Groups XII (2) and XLII(1)].

A cement for jointing safety base cinematographic films comprises of cellulose acetate powder as an active binder, along with a quick drying, non-irritating solvent, like acetone.

The following composition has been found to be the most efficient :

Cellulose acetate powder	4 gms.
Ethyl acetate	20 c.c.
Methyl acetate	20 c.c.
Acetone	60 c.c.

The proportion of cellulose acetate in the above formula may be varied from 1 gm to 7 gms, depending upon the composition of cellulose acetate powder used.

The proportions of the ingredients of solvent mixture can be varied as indicated below :

Acetone	60 ± 5 c.c.
Ethyl acetate	10 ± 10 c.c.
Methyl acetate	20 ± 10 c.c.

52111. 22 April 1953 : **Enamels for wire wound resistors**—Y. P. Varshney and S. S. Verma, CGCRI [Groups XXXVI and LVIII(3)].

Lead containing enamel compositions for wirewound resistors which possess adherence to resistance wire and porcelain core, durability and thermal stock resistance according to the invention consist of 30–35% of PbO; 10–12% of Al_2O_3; 12–15% of B_2O_3; 18–20% of SiO_2; 0–3% of colourants; 18–22% of alkalies and 1–2% of fluorine.

An improved composition may comprise 8·81 parts of Na_2O; 9·32 parts of K_2O; 2·21 parts of CaO; 34·0 parts of PbO; 0–6 parts of CaO; 10·56 parts of Al_2O_3; 13·12 parts of B_2O_3; 0·63 parts of Fe_2O_3; 10·2 parts of SiO_2; 1·04 parts of MnO_2 and 1·5 parts of F_2. The composition has fusion point that allows the application to be fired at 600–650°C without any chipping taking place during cooling of the resistor.

Reference is made to Indian Patent No. 48419.

52112. 11 June 1954 : **Improvements in or relating to cast synthetic resins**—H. A. Shah, NCL [Groups IX(1) and XIII].

Relates to a process for the manufacture of a cast phenolic resin. It consists in the condensation of esters or ethers of phenols with chloro methyl ether or dichloro methyl ether. The reaction is carried in presence of a catalyst such as aluminium chloride or boron trifluoride, sulphuric acid, zinc chloride. The esters or ethers of phenol consists of phenyl acetate, ethyl phenyl carbonate etc. The reactants are mixed and left at room temperature in a mould till the resin is formed.

52167. 21 June 1954 : **Treatment of tamarind pulp for the extraction of tartaric acid and other useful components**—B. H. Krishna, Y. S. Lewis, C. T. Dwarkanath, D. S. Johar and S. K. Lakshminarayana, CFTRI [Groups IIIX(1), XVII and XLII (1)].

Process for obtaining from tamarind pulp obtained from tamarind fruit freed from seeds, its components, namely, tartaric acid, sugars, pectin and potassium hydrogen tartrate, which according to the invention, consists in extracting the pulp by means of alcohol yielding an extract containing tartaric acid and sugars leaving a residue containing potassium hydrogen sulphate and pectin of the pulp.

The extraction is preferably, done with acidified alcohol which breaks the potassium hydrogen tartrate of the tamarind pulp to potassium acid sulphate (if H_2SO_4 is used). The alcohol may be in the form of industrial methylated spirit or isopropyl alcohol and added to attain concentration of about

65–70% in the mix. The alcohol and fruit pulp mixture may in addition be mixed with 5–10% of Keiselguhr and like filter and entire mass in a filter press to obtain clear alcoholic extract and residual cake. The alcoholic extract containing tartaric acid and sugars is treated with milk of lime to get precipitate of lime tartrate and alcohol is evaporated to get an aqueous sugar residue. The residual cake from filter press containing $KHSO_4$ and pectin is dried at 50–55°C to remove alcohol and the mass boiled with three time the weight of water and filtered to obtain pectin extract which is again extracted with alcohol to separate pectin.

52335. 14 July 1954: **Preparation of aluminium—silicon alloys**—R. M. Krishnan, M. N. Khanna, A. B. Chatterjee and B. Nijhawan, NML [Group XXXIII (1)].

Relates to a process for the preparation of aluminium-silicon alloys which consists in the aluminothermic reduction of quartz according to the equation:—

$$2Al_2O_3 + 3\ Si\ 4Al + 3\ SiO_2.$$

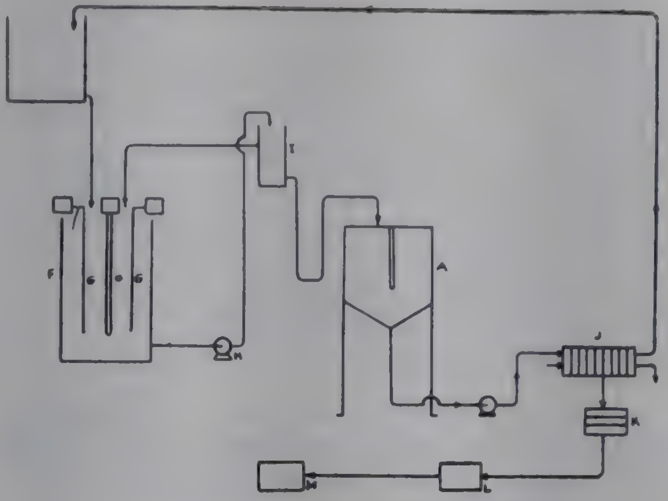
The alumina which is formed during the process as a final reaction product fluxes off with cryolite which is removed from the sphere of reaction as alumina-cryolite slag.

52338. 14 July 1954: **Process for the production of pesticidal compounds from turpentine oil**—B. Bhusan, and S. H. Zaheer, RRL, Hyderabad [Group XIX(1)].

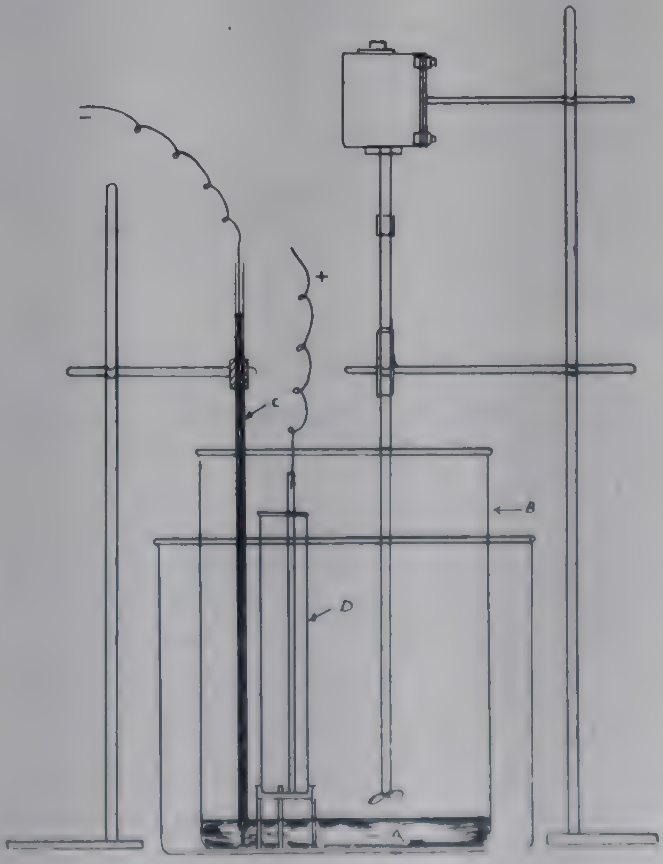
Treating oil with chlorine to get chlorine content therein between 50%–68·5%.

52394. 24 July 1954: **A process for the electrolytic preparation of cuprous oxide**—R. Viswanathan, S. Sampath, H. V. Udupa, A Joga Rao and B. B. Dey, CECRI [Group LVIII(5)].

Relates to a process for the electrolytic preparation of cuprous oxide. It consists in feeding preheated electrolytic containing not less than 10% sodium chloride by weight and 0·3 to 1 gram per litre alkali (expressed as sodium hydroxide) into cathode chambers of an electrolytic cell in which sheet is used as cathode and pure or refined copper sheet is employed as anode and wherein the rate of flow of electrolyte is such that the alkalinity of the bath is always maintained at the specified optimum range viz. 0·3 to 1 gpl expressed as NaOH. The cell (A) has a container (Z) and bottom (P). The products are removed by opening (Q). The electrodes (C, D) are introduced through a lid. The diaphragms are indicated at (E). The electrolyte is preheated in a tank before introduction.



52631. 27 August 1954: **A process for the electrolytic preparation of salicylaldehyde**—H. V. Udupa and B. B. Dey, CECRI [Group LVIII(5)].



Relates to a process for the preparation of salicylaldehyde. It consists in electrolytic reduction of salicylic acid using sodium sulphate as electrolyte in presence of boric acid and a critical *p*H range between 5·4 to 6·4 and not exceeding 7 is maintained. Sodium chloride may be used in place of sodium sulphate when chlorine is obtained as a bye product. In the figure, (A) is the layer of mercury in a beaker (B). Porous pot (D) serves as an anode chamber.

52657. 1 September 1954: **Preparation of synthetic tanning materials from gas tar**—Y. Nayudamma, CLRI [Group XXIV(3)].

Gas tar freed from any trace of water and suspended and insoluble matters is sulphonated with concentrated sulphuric acid and the resulting soluble product is decolourised with aluminium or zinc and the decolourised product is adjusted to a final *p*H of 3 to 4.

By way of Example

1 lb. of filtered tar is sulphonated with 1 lb. of commerical H_2SO_4 at a temperature of 90-120°C. with constant stirring. The product is allowed to cool when it sets into a jelly. The sulphonated product is dissolved in 2 lbs. of water to which 150-200 gms. of aluminium dust and 50-100 c.c. of H_2SO_4 are added and heated on water bath for $\frac{1}{2}$-1 hour with constant stirring. The excess of aluminium dust is filtered off and the filtrate is adjusted to a *p*H of 3·5 by adding $Ca(OH)_2$. The precipitated $CaSO_4$ is now removed and the filtrate collected.

Indian Specification No. 52709 is referred to.

52670. 2 September 1954: **Enzyme bates for leather manufacture**—S. Bose and B. M. Das, CLRI [Groups IX(1) and XXIV(3)].

A process for the production of enzyme bates for leather manufacture using enzymes derived from the mold *Aspergillus parasiticus* or *Aspergillus oryzae* is characterised in that the mold is grown on a culture medium of which tapioca flour is an ingredient. The culture medium may consist of wheat bran, lactic acid, tapioca flour and water. After developing the molds the enzymes are isolated by water-extraction of the molds and precipitation of the enzymes with ammonium sulphate. The enzyme bates are prepared by mixing the precipitated enzyme with the fine wood flour, drying the mixture and adding ammonium sulphate, the quantity of which can be varied for preparing different grades of the bates for use in the manufacture of various kinds of leather.

52705. 10 September 1954: **Modification of a process for the preparation of synthetic tanning materials from gas tar**—Y. Nayudamma, CLRI [Group XXIV(3)].

Gas tar freed from any trace of water and suspended and insoluble matters is sulphonated with concentrated sulphuric acid and the resulting soluble gas tar sulphonate is decolourised under hightly alkaline conditions with aluminium dust. The decolourised product is adjusted to a final *p*H of 3 to 4.

By way of Example

2 lbs. of tar sulphonate is dissolved in 1 lb. of water to which 150-175 gms. of aluminium dust is added. To this mixture 600-700 c.c. of 40% commercial NaOH is added slowly with constant stirring. Hydrogen gas is evolved and the material is decolourised resulting in a brownish liquid. To this solution 50 gms. of sodium citrate is added and 50-100 c.c. of H_2SO_4 is added to bring it back to a *p*H of 3 to 3·5 The material is filtered off and the syntan so prepared can be used as an independent or combination or auxiliary tanning agent, producing satisfactory leathers.

Indian Specification No. 52657 is referred to.

52706. 10 September 1954: **Modification of a process for the preparation of synthetic tanning materials from gas tar**—Y. Nayudamma, CLRI [Group XXIV(3)].

Gas tar freed from any trace of water and suspended and insoluble matters is sulphonated with concentrated sulphuric acid and the resulting gas tar sulphonate is decolourised with aluminium or zinc. Novolak resin is added to the decolourised gas tar sulphonate. According to a preferred embodiment of the process, a sulphonated novolak resin is added to the gas tar sulphonate which has been decolourised under acid conditions.

Indian Specification No. 52657 is referred to.

52707. 10 September 1954: **Modification of a process for the preparation of synthetic tanning materials from gas tar**—Y. Nayudamma, CLRI [Group XXIV(3)].

Novolak resin is mixed with gas tar and the mixture is sulphonated with sulphuric acid. The sulphonated material is decolourised under acidic conditions or alkaline conditions with aluminium dust. Excess of aluminium dust is filtered off and the filtrate is adjusted to a *p*H of 3 to 3·5 by adding an alkali or weak acid.

By way of Example

1 lb. of tar is mixed with 1 lb. of novolak resin and sulphonated with 1½ lbs. of H_2SO_4. The sulphonated product is dissolved in an equal amount of water and reduced with 150-200 gms. of aluminium dust in dilute acidic conditions. The material is filtered and the filtrate finally adjusted to a *p*H of 3 to 3·5 by the addition of 40% NaOH.

Indian Specification Nos. 52657 and 52705 are referred to.

52708. 10 September 1954: **Modification of a process for the preparation of synthetic tanning materials from gas tar**—Y. Nayudamma, CLRI [Group XXIV(3)].

Gas tar freed from any trace of water and suspended and insoluble matters is sulphonated with conc. sulphuric acid. The resulting soluble gas tar sulphonate is decolourised under alkaline conditions with aluminium or zinc and mixed with sulphonated novolak resin.

Indian Specification Nos. 52657, 52705 and 52706 are referred to.

52709. 10 September 1954: **Modification of a process for the preparation of synthetic tanning materials from gas tar**—Y. Nayudamma and N. Viswanathan, CLRI [Group XXIX(3)].

Gas tar freed from any trace of water and suspended and insoluble matters is sulphonated with concentrated sulphuric acid and the resulting soluble gas tar sulphonate is decolourised under highly alkaline conditions with zinc dust. The highly alkaline decolourised product is neutralised with a highly acidic sulphonated novolak resin. The resulting material is adjusted to a *p*H of 3·3 to 3·5 by adding acetic acid. The syntan thus obtained has the characteristics of a good tanning agent and can be used in the production of leathers of good quality with characteristic properties of this tannage.

Indian Specification Nos. 52657 and 52706 are referred to.

52710. 10 September 1954: **A process for the isolation of the alkaloids of Rauwolfia serpentina Benth**—V. N. Sharma and M. M. Dhar, CDRI.

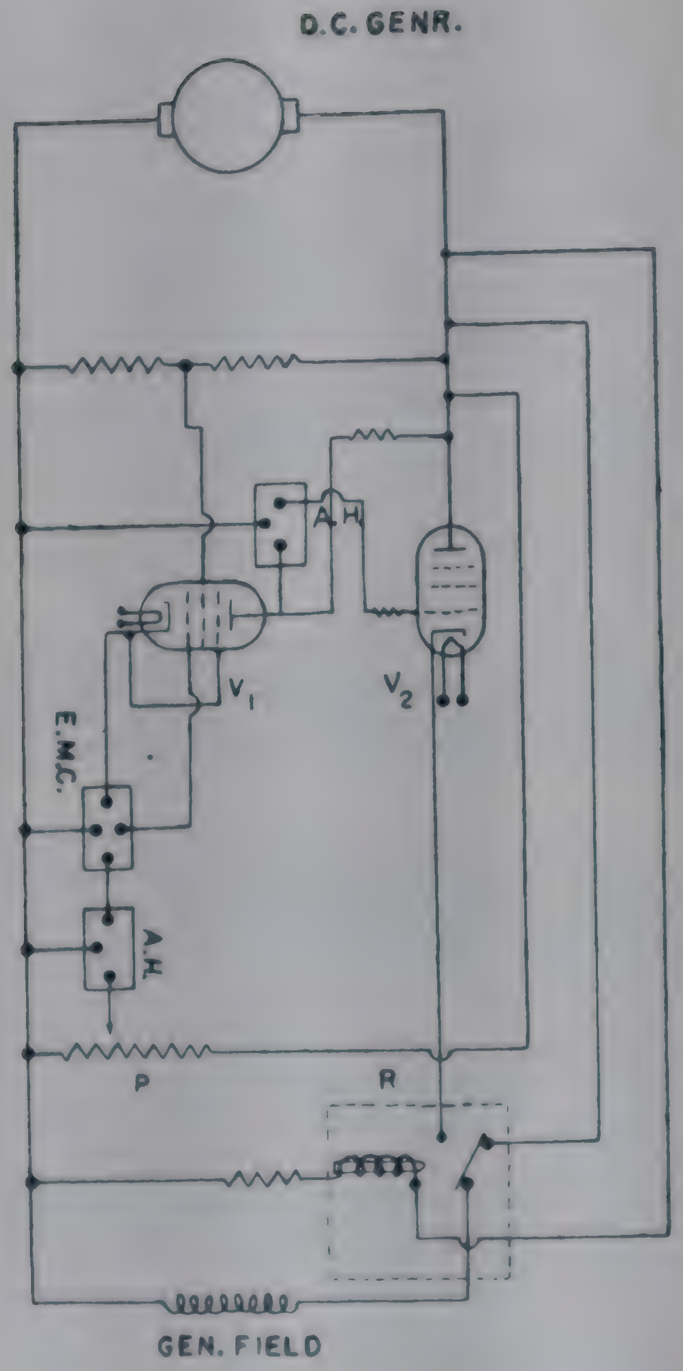
52711. 10 September 1954: **An electronic voltage regulator for shunt wound and compound-wound D. C. generators**—J. Mahanty and A. N. Prasad, NPL [Groups LVII(1) and LVII(3)].

Electronic voltage regulator for shunt wound or compound wound d.c. generator consists of an amplifier unit in combination with means for the supply of plate voltage of the amplifier unit (V_1, V_2, A.H.) from the same d.c. generator as is being regulated. The means consist of the connection of the plate supply terminal of the amplifier unit to the positive of the generator output and the ground terminal of the amplifier unit to the negative of the generator output. The amplifier unit possesses the following parts:—

(a) a "d.c.-amplifier" which amplifies an error signal obtained by comparing a part of the output voltage of the generator with a standard voltage, the output of which after phase inversion is fed to a "power amplifier".

(b) a "power amplifier".

(c) anti-hunt circuits in the feed back signal channel to prevent instability in operation.



52798. 25 September 1954: **A process for the preparation of synthetic tanning materials**—N. Viswanathan and B. M. Das, CLRI [Group XXIV(3)].

Synthetic tanning materials are prepared by condensing a phenol with an aldehyde and sulphonating the water insoluble condensate with a condensed sulphonated non-phenolic aromatic compound (obtained by sulphonating a non-phenolic aromatic compound like naphthalene to obtain sulphonated naphthalene sulphonic acid, followed by condensing the sulphonated product with formaldehyde).

52799. 25 September 1954: **A process for the preparation of synthetic tanning materials**—N. Viswanathan and B. M. Das, CLRI [Group XXIV(3)].

Synthetic tanning material is prepared by condensing a phenol with an aldehyde and sulphonating with a condensed sulphonic acid of a phenolic aromatic compound. Examples of phenol are naphthol, phenol or the like and those of aldehydes are formaldehyde, acetaldehyde, benzaldehyde, crotonaldehyde or the like.

52801. 25 September 1954: **The production of special gelatin solution suitable for use as a plasma substitute (plasma volume restorer or expander) by a new method**—M. Damoderan and S. G. Singh, NCL [Group XIX(1)].

A process of preparing a modified gelatin suitable for transfusion, by the regulated action of proteolytic enzymes on gelatin prepared from bones under conditions which avoid bacterial infection and degradation of protein. The process consists of preparing the ossein from the long bones of goat, sheep or cattle and extracting the gelatin from the said ossein with distilled water. The long bones are dehydrated, defatted, demineralised and deproteinised before extraction.

The bones are dehydrated and defatted first with acetone and then with light petroleum ether. The dried material is treated with dilute hydrochloric acid for demineralisation. The extraction is carried out at a neutral *p*H. The extracted gelatin is fractionated with acetone. The extract of gelatin is concentrated under vacuum at a temperature below 50°C. to a gelatin concentration of approx. 6%. The concentrated gelatin solution is clarified by adjusting the *p*H to 4·6, adding egg white dissolved in sodium chloride solution and separating the the coagulated egg white by centrifugation. The gelatin extract is treated with trypsin for reducing the viscosity of the gelatin, the treated gelatin is precipitated by the addition of acetone, the precipitate is dissolved in pyrogen free distilled water, the solution is freed from the last traces of acetone and after filtration is bottled under aseptic conditions.

52834. 30 September 1954: **A process for the treatment of vegetable tan**

liquors—R. Selvarangan and Y. Nayudamma CLRI [Group XXIV(3)].

Vegetable tan liquors are stabilized by adding, aluminium salts to said tan liquors.

By way of Example

Leather produced with a Goran liquor 4000 c.c. of which contains 60 gms. of potash alum, 20 gms. of sodium citrate, 10 gms. and 100 c.c. of water, is lighter in colour, fuller in substance of higher tensile strength and stands to a higher shrinkage temperature as compared to the leather produced with unmodified Goran tan liquor.

52835. 30 September 1954 : **Preparation of synthetic tanning materials from phenolic bodies**—D. Mukherjee and B. M. Das, CLRI [Group XXIV(3)].

Synthetic tanning material is obtained by sulphonating phenolic body with anhydrous sodium sulphite and formaldehyde treating the sulphonated product under pressure with the product obtained by condensing resorcinol with formaldehyde and further condensing the resulting product with urea and acetone.

By way of Example

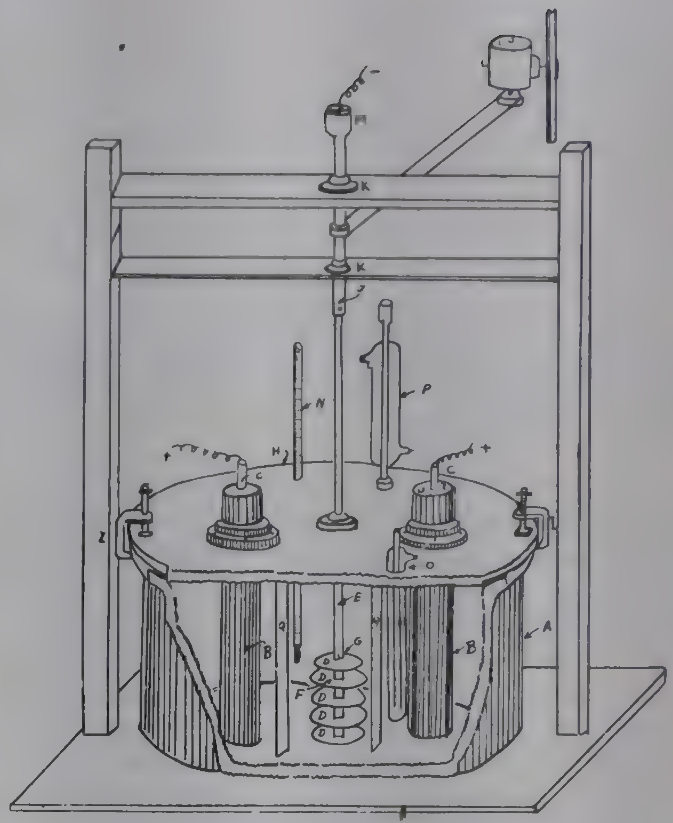
100 gms. of cresol and 85 gms. of 30% formaldehyde are taken in a flask and heated up to 50°C 62·5 gms. of anhydrous sodium sulphite are added during 1/2 an hour. The mixture is refluxed and cooled and upper layer is taken out and acidified with acetic acid to pH_4.

50 gms. of resorcinol are dissolved in 25 c.c. of water and condensed with 17·5 gms. of 40% formaldehyde under a reflux condenser for 1½ hours.

The condensed resorcinol formaldehyde product is mixed with sulphonated cresol and heated at 115°C under pressure in an autoclave at a pressure of 15 lbs. for 3 to 4 hours. It is cooled and further condensed with 26·5 gms. of urea dissolved in 30 c.c. of water and 40 gms of acetone for 4 hours at 35°C.

53195. 23 November 1954: **Electrolytic preparation of para-aminophenol**—G. S. Krishnamurthy, H. V. Udupa and B. B. Dey, CECRI [Groups IX(1) and LVIII(5)].

Relates to a process for the electrolytic preparation of para-aminophenol which consists in the reduction of nitrobenzene in acid medium at rotating amalgamated copper, brass, nickel or monel disc type cathode wherein the discs are mounted on a shaft and separated from one another by means of spacer collars and wherein the inter-disc distance is equal to or more than the radial distance of the disc jutting out of the spacers. Preferably an inter disc distance of 1″ is maintained for a disc which is 2·5″ diameter or for a disc of 1·25″ radius out of which 0·94″ juts out of the spacers radially. A current density of 6 to 25 amps/dm^2 is employed. When 20% sulphuric acid is used as catholyte, the ratio of depolarizer to catholyte is up to 1 : 7, while with 30% sulphuric acid, the ratio is up to 1 : 4. The catholyte is cooled to 0°–5°C after removing unreduced nitrobenzene and tarry matter and also after vacuum concentration and para-aminophenol sulphate is isolated. Fig. shows the apparatus required.



53196. 23 November 1954: **Manufacture of upholstery leathers**—R. Selvarangan and B. M. Das, CLRI [Group XXIV(3)].

Relates to a process for the manufacture of upholstery leather. It consists in subjecting bark tanned hides and splits to retaining with normal or basic aluminium salts and finishing them as upholstery leathers by steps comprising setting, straining, staking, snuffing, lacquering and hot plating or embossing. The pickling bath preferably, includes 10=15% on the sammed leather weight of the aluminium salts.

Reference is made to Indian Patent No. 47597.

53197. 23 November 1954: **Process for the manufacture of tanned skins**—R. Selvarangan and B. M. Das, CLRI [Group XXIV(3)].

A process for production of tanned skins, particularly white tanned snake skins from raw skins, comprises subjecting the skins to soaking, liming, deliming, tanning and fat liquoring and the acid or calgon pickled skins are tanned with an aluminium salt normal or basic such as normal aluminium sulphate, potassium, sodium or ammonium alum, normal aluminium chloride, basic aluminium sulphate, basic aluminium chloride or basic salts of organic acids.

53198. 23 November 1954: **Manufacture of basic aluminium chloride**—R. Selvarangan and B. M. Das, CLRI.

53199. 23 November 1954: **A process for the isolation of alkaloids of Rauwolfia densiflora Benth**—M. M. Dhar, S. Bhattacharji and M. L. Dhar, CDRI.

53270. 6 December 1954: **Improvements in or relating to the manufacture of unadulterated east Indian tanned leathers**—S. K. Mitra and B. M. Das, CLRI.

53319. 13 December 1954: **A process for improving the storage life of cashew kernels**—Mangla Prasad and Prem Bihari Mathur, CFTRI [Groups I(3) and XIV(5)].

Storage life of cashew kernels is improved by subjecting the kernels to deep frying followed by incorporation of an antioxidant fortified with an acid synergist such as ascorbic, citric or phosphoric acids. The deep frying is done on edible hydrogenated oil such as in "Dalda" (a Vanaspati) at 160°-180°C for 70-90 seconds. The antioxidant used is gum guaiac or butylated hydroxy anisole and ·05 to ·1% of gum guaiac or ·02 to ·05% of butylated hydroxy anisole on the weight of the oil are used. The synergist added is ·002 to ·02% on the weight of the oil. The excess of oil is removed by centrifuging. The term "deep frying" means frying in a large quantity of fat.

Reference is made to Indian Patent No. 49838.

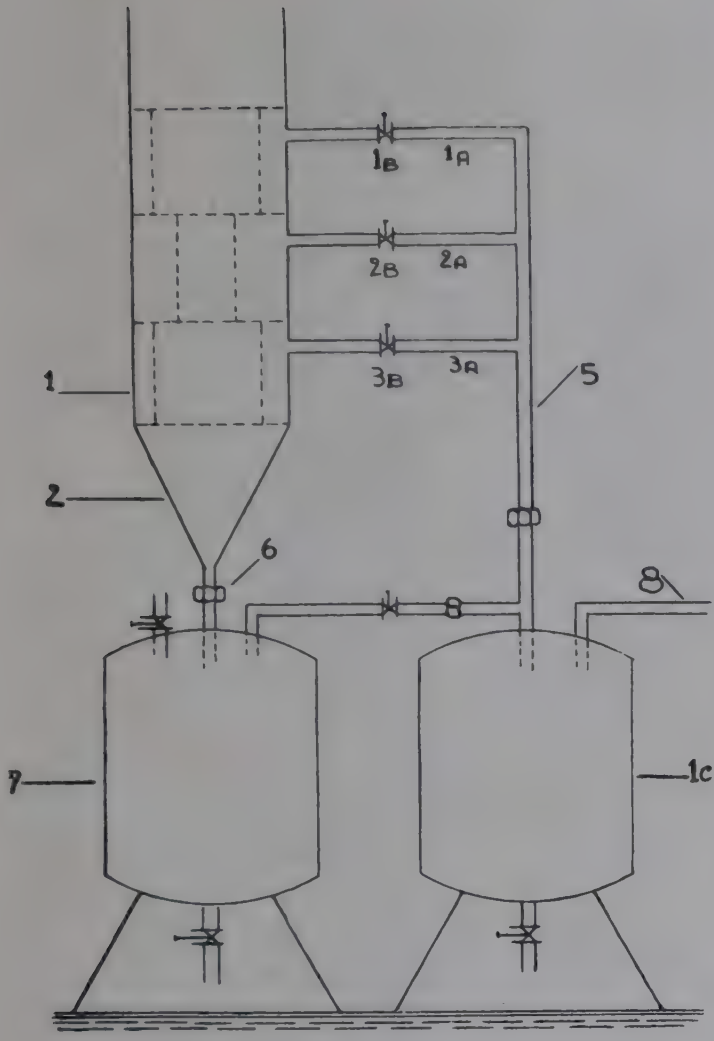
53347. 15 December 1954: **A process for production of a new type of fertilizer and soil stabilizer from coal, lignite, peat or the like**—Adi Nath Lahiri and P. N. Mukherjee, CFRI [Groups I(4) and IX(1)].

Relates to the preparation of a fertilizer and a soil conditioner from carbonaceous materials like humic acid prepared by the process of co-pending application No. 53527.

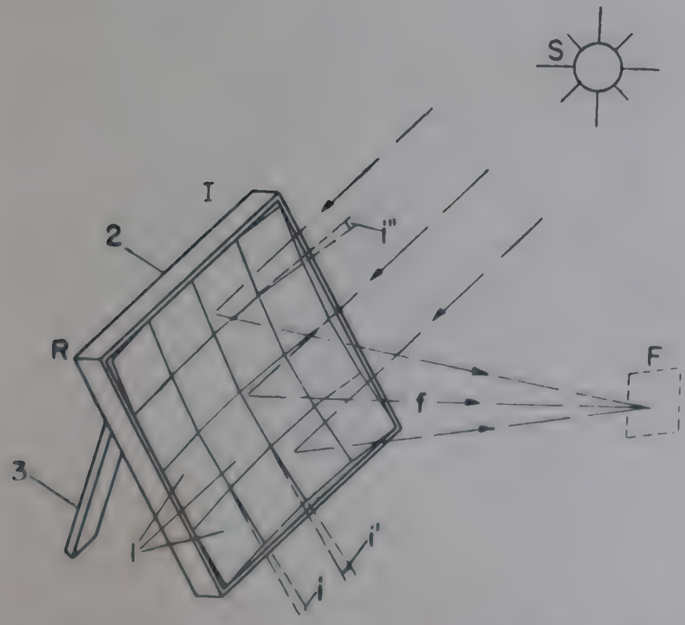
These carbonaceous materials are treated with either gaseous ammonia or an ammonia solution to increase its nitrogen content. The reaction is carried out at atmospheric temperature and pressure or at 40°C-200°C and a pressure varying from 1-60 atmospheres built up by the vapourisation of ammonia. The reaction may also be carried out in presence of catalysts such as NH_4Cl, $ZnCl_2$, $CaCl_2$, $Cu_2 Cl_2$ or $Cu Cl_2$.

53348. 15 December 1954: **A process for removal of pink colour and offensive smell from lake bitterns**—Mata Prasad, D. L. J. Mehta and R. K. Sapre, CSMCRI [Group VI].

A process for the removal of the pink colour and the offensive smell from solid and liquid bitterns consists in passing the liquid bitterns or a solution of solid bitterns or a mixture of solid and liquid bitterns through untreated or treated cellulose or paper pulp filters. The bitterns obtained from Sambhar lake may be employed for this process. The cellulose or paper pulp filters are kept on perforated plates in a tower or series of towers, and the bitterns are passed through these filters. The tower is a vertical cylinder divided into an equal number of sections 3 and at each section perforated plates 4 are provided.



53369. 17 December 1954 : **Apparatus for concentrating solar energy**—A. L. Gardner, NPL [Groups VII(2) and XXXVIII(2)].



A solar heating device consists of a reflector 1 consisting of an assembly of a plurality of mirrors 1 so inclined one to another as to produce a substantially coincident image from the said mirrors. The mirrors are mounted on a portable framework 2. The focal length of the reflector is at least twice the maximum dimension of the surface of the reflector. The reflector is provided with a support such as a hinged leg 3 or like to adjust the direction of the axis of the reflector to maintain the image at the fixed focal position F. A number of separate portable reflectors are so disposed as to concentrate the sun's heat on to a single focus.

53372. 20 December 1954 : **Improvements in or relating to the manufacture of ceramic capacitors**—T. V. Ramamurti, C. V. Ganapathy and S. S. Mathur, NPL [Groups III, XXXIII(8) and LVIII(2)].

A process for the manufacture of ceramic bodies suitable for making ceramic capacitors, consists in sintering at 1100°C to 1300°C tablets made by pressing titanium dioxide material of commercial quality. The term "commercial quality" includes titanium dioxide material having a titanium dioxide content greater than 98·5% but less than that of titanium dioxide of spectral purity quality. Titanium dioxide of 'rutile' type or 'anatase' type which has been given electrical properties similar to rutile by addition of a flux such as felspar or kaolin, is preferably used.

53390. 21 December 1954 : **An improved method for the production of manganese sulphate from manganese ores and its application for the regeneration of spent electrolytic manganese sulphate bath**—P. P. Bhatnagar and T. Banerjee, NML [Groups III and LVIII(5)].

Relates to a process for the production of manganese sulphate from manganese ore which consists of digesting manganese ore with dilute sulphuric acid and iron. The ore may also be digested with the spent liquor containing dilute sulphuric acid from a manganese dioxide bath and iron. The ore is crushed and sieved through 100 mesh B.S.S. sieve before it is digested with dilute sulphuric acid and iron at a temperature of 100°C for 5-7 hours at atmospheric pressure.

53414. 24 December 1954: **Process of treating molasses to give a solid material and the use of the same in phenolic-type plastics**—Arthur Ghosh, NCL [Group XII(2)].

Relates to a process for treatment of molasses to render it suitable for use as a component in phenolic type moulding composition. It consists in dehydrating the molasses under vacuum of 15·30 mm. of mercury to about 50–55% by weight and heating the product obtained at atmospheric pressure or at slightly reduced pressure i.e. about 150 mm. below atmospheric pressure, until a material is obtained having a volatile content of 95–97%. The powder so obtained from the molasses is used with a novolak resin to obtain a moulding composition and the percentage range of molasses in the moulding powder, based on the weight of novolak resin varies from 30–50%.

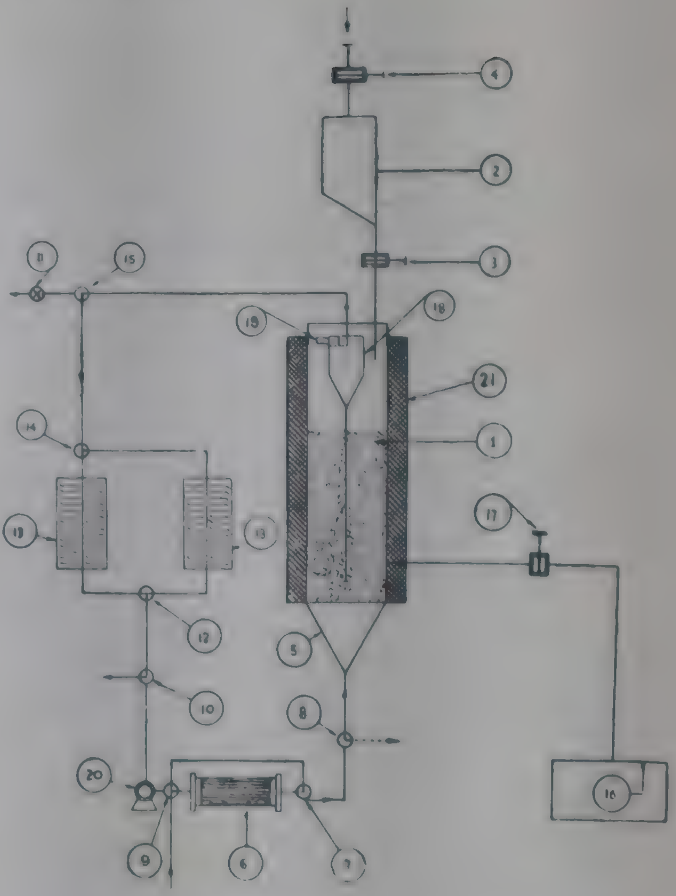
53462. 3 January 1955: **High dielectric constant ceramics**—T. V. Ramamurti, C. V. Ganapathy, S. S. Mathur and R. Krishnan, NPL [Groups LVIII(2) and LVIII(3)].

High dielectric constant ceramics are produced by mixing ceramic materials consisting essentially (i) largely of titanium dioxide, (ii) alkaline earth oxide/s, (iii) (a) stannate/s of alkaline earth oxides and/or (b) zirconate or the rate of magnesium and sintering the mixture at 1400°C. Preferably titanium dioxide in the active form of rutile of commercial quality and known as "Rutiox (Kronos)" is employed. In a preferred form a mixture of titanium dioxide, barium carbonate, calcium carbonate and stannic oxide are used for sintering to form barium titanate and calcium stannate in finished body.

53509. 10 January 1955: **Preparation of titanium hydride**—S. Ramamurthy, BHU.

53527. 12 January 1955: **An improved Process for the production of humic acid from coal or lignite**—P. N. Mukherjee, A. K. Das Gupta, A. N. Basu and A. Lahiri, CFRI [Group IX(1)].

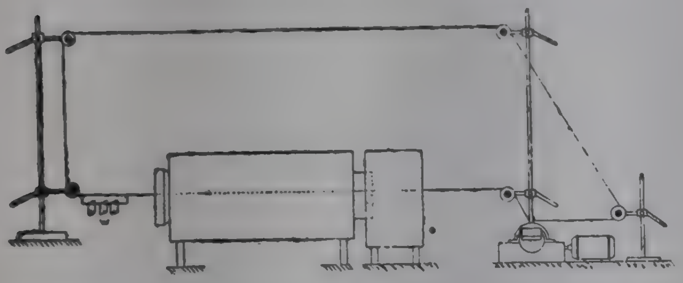
Process for the preparation of humic acid by oxidising coal or lignite at a low temperature between 100–300°C and isolating the humic acid therefrom, is characterised in that oxidation is carried out in presence of gaseous or solid catalyst which will accelerate the formation of the humic acid in a fluidised or moving bed. As a catalyst there may be used either nitrous oxide, nitric oxide or nitrogen peroxide gas along with oxidised air or oxygen stream in the quantity of 0·1–5% the gas stream. As solid catalyst there may be used one or more of a group of bodies comprising nitrates or oxides of iron and nitrates of sodium or potassium.



Thus in operation, pulverised coal may be supplied via hopper, 2 controlled by means of slide valve, 4 to an oxidation unit, 1 provided with insulation jacket, 21 and having at its bottom a conical expansion space, 5 through which a mixture of air and oxides of nitrogen preheated through a preheater, 6 is introduced. The pre-heater, 6 may be by-passed via cocks, 7 and 9 if necessary. Gas samples may be obtained via cock 8 provided between preheater, 6 and expansion space, 5. Gaseous oxidation products from inside unit 1 may be passed through cyclone, 18 via opening, 19 and through filters, 13 and blower 20, and then to an exhaust, 11.

Any desired recycle ratio of the gases can be maintained by operating three way cocks, 14, 15 and valve 12. The oxidised coal from unit, 1 may be passed on to a storage vessel 16, via slide valve 20.

53528. 12 January 1955: **A pyrochemical process for the metallisation of non-conductors**—C. V. Ganapathy, T. V. Ramamurti and S. D. Sehgal, NPL [Group LXIII(3)].



A pyrochemical process for the metallisation of non-conductors which consists in mixing a metallic compound (such as silver oxide, gold chloride, platinum chloride or the like which on heating decomposes into the metal) in a lacquer to which has been added a bender, applying the composition to the non-conducting surface and reducing the metallic compound to the base metal by heating to a temperature up to 300°C and thereafter burning off. The binding medium by raising the temperature above 300°C and which is characterised in that the binder emloyed consists of a compound stable up to 300°C namely, tricresyl phosphate, triethanolamine oleate or castor oil. After reduction, the binder is burnt off in 6–15 min. by raising the temperature to 600–650°C. This invention is particularly used for coating mica with silver for the manufacture of silver mica capacitors. The mica is coated with a silver oxide paint made by mixing (a) a substantially neutral compound of silver e.g., silver oxide, (b) a lacquer serving as a temporary bonding medium and (c) a binder of the type of tricresyl phosphate, which is then heated.

53607. 20 January 1955 : **Improvements in or relating to the manufacture of chemicals for absorption of carbon dioxide**—S. K. Bose, N. G. Basak and A. Lahiri, CFRI [Group IV(1)].

A process for the manufacture of an absorbent for carbon dioxide consists in fixing lime and soda on a Kieselguhr alumina base. The fixation is done by adding kieselguhr to a sodium hydroxide-aluminate solution of and mixing the resulting slurry with lime slurry to obtain a uniform paste and drying the paste. Under Indian conditions 10–15% moisture in the absorbent is the critical moisture content for the best performance. The material therefore has to be carefully dried under proper humidity conditions.

53608. 20 January 1955 : **Manufacture of ceramic semi-conducting bodies of titanium dioxide**—T. V. Ramamurti, C. V. Ganapathy, S. S. Mathur and R. Krishnan, NPL [Group LVIII(3)].

Relates to a process for the manufacture of semi-conducting bodies of titanium dioxide which consists in sintering the 'commercial quality' titanium dioxide of the anatase form as defined below at 1350°–1450°C. It is possible to control the degree of conductivity by adding graded amount of the "rutile" type of titanium dioxide similar to "Rutiox (Kronos)", to the anatase variety, the amount added being less than 3% by weight of the total charge. Graded amounts of fluxes like sodium or potassium titanate in amounts less than 0·2% or less than 1% of the felspar also gives the same result. This process obviates the necessity for having a reducing gaseous atmosphere required when a rutile type of TiO_2 is sintered for obtaining semi-conductor bodies.

53636. 25 January 1955: **Improvements in or relating to coating compositions**—K. K. Sarin and S. L. Kapur, NCL [Group XII(3)].

Relates to a process for the preparation of a coating composition which cures or hardens at temperature between 110–400°F which comprises the mixing of an amyl alcohol modified urea resin with a modified alkyd resin, e.g. as an oil modified glycerol phthalate alkyd or an oil modified glycerol maleate alkyd and an accelerator such as salicylic acid, benzoic acid, maleic anhydride or aluminium chloride. Modified urea-resin is prepared by reacting urea formalin and amyl alcohol at 90-95°C for a few hours at a *p*H of about 4·5. The accelerator is added in a suitable solvent before addition or is added as such and dissolved in the resin solution. Pigments such as titanium dioxide, zinc oxide, lithopone white or carbon black may also be added and ground. The amount of accelerator added is 0·5-5% on the weight of the urea resin.

53637. 25 January 1955 : **Preparation of synthetic tanning materials from rosin**—A. Ganesan and Y. Nayudamma, CLRI [Group XXIV(3)].

Synthetic tanning materials are prepared by chlorinating resin and sulphonating the chlorinated product. In a preferred embodiment, resin is melted and chlorinated and then the chlorinated product is sulphonated with sulphuric acid; thereafter the sulphonated product is dissolved in water the soluble product is neutralised with caustic soda or lime to a *p*H of 3.

53651. 27 January 1955 : **Improvements in or relating to synthetic tanning materials**—D. Mukherjee and B. M. Das, CLRI [Groups IX(1) and XXIV(3)].

Relates to a process for preparing synthetic tanning materials. It consists in sulphonating salicylic acid with conc. H_2SO_4 and then condensing the sulphonated products with formaldehyde. The sulphonation is preferably done at high temperature such as 160-165°C or at moderately high temperature at 110°C.

53652. 27 January 1955 : **Improvements in or relating to synthetic tanning materials**—D. Mukherjee and B. M. Das, CLRI [Groups IX(1) and XXIV(3)].

Process for the preparation of synthetic tanning material consists in (i) sulphonating cresols, phenols or homologues of phenols or cresols, condensing the sulphonated products with formaldehyde thus yielding condensed phenol (cresols or homologues of phenols or cresols) sulphonic acid (ii) sulphonating salicylic acid and condensing the "salicylic sulphonic acid" thus obtained with formaldehyde to yield condensed salicylic sulphonic acid, mixing the products of (i) and (ii) and condensing the mixture with urea and acetone and subjecting the condensed product thus obtained to heating under pressure in a closed vessel.

Thus sulphonation of phenols or cresols is done preferably for 5-6 hr. at 100-105°C. and the condensation with 30% formaldehyde is done for 10 to 12 hrs. at 30-35°C. The sulphonation of salicylic acid is done preferably at 160-165°C. for 4-6 hrs. and condensation with 30% formaldehyde is done for 2 hrs. at 110°C. Condensation with urea and acetone is carried for 4 hrs. at 30-35°C. The mixture of the condensed product is subjected of 120°C under a pressure of 20 lb. for 2-3 hrs.

53653. 27 January 1955 : **Improvements in or relating to synthetic tanning materials**—D. Mukherjee and B. M. Das, CLRI [Groups IV(1) and XXIV(3)].

Process for the preparation of synthetic tanning materials consists in (i) sulphonating β-naphthol, condensing the sulphonated naphthol with formaldehyde (ii) condensing phenol or homologues thereof with formaldehyde; dispersing product of (ii) in product of (i) and condensing the dispersion with formaldehyde and acetone. The sulphonation of β-naphthol is carried at 120-125°C for 5 hrs. and condensation with 30% formaldehyde is done at 100°C. for 15 hrs. The condensation of phenol is carried for 3 hr. at 90-95°C. using H_2SO_4 as catalyst. The condensation with formaldehyde is done in a reflux condenser at 85-90°C. and heating with acetone is done in an autoclave for 2-3 hrs. at 10 lb. pressure.

53798. 14 February 1955 : **Improvements in or relating to leather manufacture**—A. I. Ganesan and B. M. Das, CLRI [Group XXIV(3)].

A process for production of improved leather, is characterised by the impregnation of hides and skins, at any stage of leather manufacture with a protein liquor. The said protein liquor is made by digesting raw hides and skins trimmings and fleshings with an acid such as sulphuric acid at elevated temperature. Impregnation with protein liquor is preferably carried out at the pickling stage of leather manufacture.

53817. 16 February 1955 : **Manufacture of high dielectric constant ceramics**—T. V. Ramamurti, C. V. Ganapathy and S. S. Mathur, NPL [Groups III, XXXIII(8) and LVIII(2)].

High dielectric constant ceramics are manufactured by sintering at elevated temperatures of the order of 1400°C tablets made by pressing ground rutile mineral. Sand alone or in admixture with ingredients such as, alkaline earth or rare earth carbonates or oxides (other than commercial quality titanium dioxide) hitherto employed for the manufacture of titanate ceramics. Suitable examples of such ingredients are barium carbonate, calcium carbonate and stannic oxide. The ceramics are used as capacitor bodies. Reference is made to Indian Patent Specification No. 53462.

54040. 16 May 1955 : **Composition for testing wool**—S. K. Mitra and B. M. Das, CLRI [Group XXII(1)].

The invention relates to a composition for testing the wool with a view to detect and estimate the damage therein which consists of a solution of lactophenol cotton blue prepared by mixing the following ingredients phenol,—10 g. lactic acid,—10 c.c.; glyecrine, —20 c.c.; water,—10 c.c.; and cotton blue, —0·05 g.

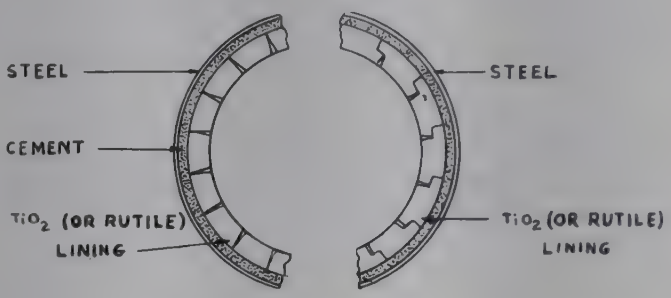
The wool is treated with the aforesaid solution for a few minutes when damaged wool fibres are dyed deep blue which can be readily seen and counted under microscope by reflected illumination and the result analysed statistically. This method of examination requires 15 to 20 min. in all.

54074. 19 March 1955 : **Bitumastic jointing composition**—S. Bagchi, C. G. Swaminathan and R. K. N. Iyengar, CRRI [Group XII(2)].

Bitumastic composition for filling constraction joints of concrete slabs, floors, roadways and airfields, of this invention, comprises (i) castor oil gel (ii) a binder such as asphalt, bitumen, coal tar, pitch or the like and (iii) a filler such as sand, quarry grits dust brick or the like. The composition may contain in addition a softener such as anthracene oil, mineral lubricating oil of petroleum origin and a tackifier such as softened rubber.

A typical composition may have 5—10% of castor oil gel, 30—50% of the binder and 40—60% of a filler by weight of composition and is prepared by mixing the ingredients at 100—150°C. and mechanically stirring till a thoroughly dispersed mass is obtained.

54263. 14 April 1955 : **Improvements in or relating to the manufacture of titanium dioxide and for titanate ceramics**—T. V. Ramamurti, C. V. Ganapathy and S. S. Mathur, NPL [Groups XXV(1) and XXXIV(2)].



The invention relates to the manufacture of titanium dioxide ceramic bodies or titanate ceramic bodies. The process comprising wet grinding titanium dioxide, granulating, shaping and sintering the ground powder and is characterised in that the said grinding is caried out in a ball mill made from titanium dioxide. The ball mill pot and balls are made of fine titanium dioxide powder and fired at 1200°C to 1250°C. The ball mill pot, 1 is made of hardened cylindrical blocks of titanium dioxide by pressing a mixture of fine powder of said titanium dioxide, drying in an electric oven at 100°C, hardening by biscuiting at 900°C. in a furnace and then sintering at 1200°C. Similarly lid, 3 is also made of cylindrical blocks and balls, 4 by shaping by hand from TiO_2 (or rutile) and sintering at 1200°C. The pot, 1 is encased in a steel frame, 2 and held by cement 5, the cover, 3 has rubber, 6 to avoid leakage of the material. Titanate ceramics may be prepared from titanium dioxide, barium titanate and alkaline earth stannates or magnesium zirconates.

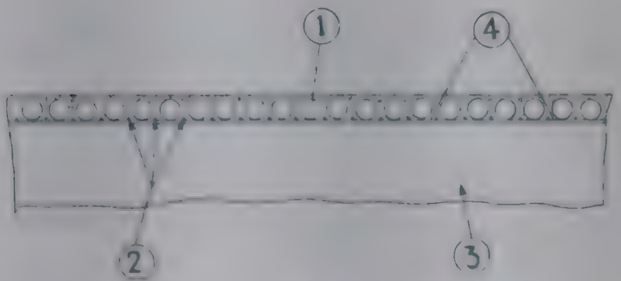
54264. 14 April 1955 : **A process for the preparation of new desiccants and**

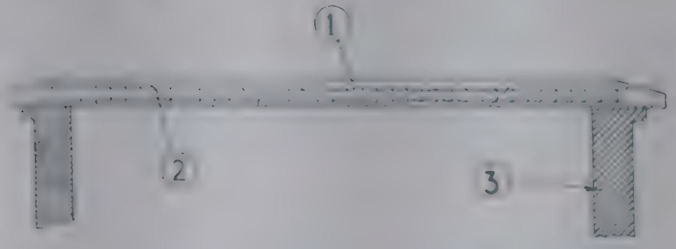
dehumidifiers—R. P. Puri, K. Sarinand A. Lahiri, CFRI [Group VIII].

New desiccants and dehumidifiers from coal, peat, lignite and like naturally occurring vegetable degradation materials are prepared by preparing an ion-exchanger product from the said materials and activating the said product by heating it at 100–110°C. The ion-exchanger product is prepared by adding to the said materials heavy tar distillates such as middle oil, creosote oil, or anthracene oil, heating it to dryness and sulphonating it. The ion-exchanger can be heated by any standard method of direct or indirect heating, preferably hot air at 110°C is passed over the material for activation. Introduction of various cations prior to the activation varies the desiccating efficiency in the following order :—

$Li > Mg > Ca > Na > Sr > NH_4 > K > Ba > H$.

54361. 28 April 1955: **Construction of flat or arched roofs or like structures**—C. H. Khadilkar, CBRI [Group XXVI (1)].





In a method of constructing a flat or an arched roof or like structure rows of hollow earthen tiles, 1, each tile being inserted into the next one, are fixed and covered with plaster; in the case of the flat roof or structure, reinforcement bars of mild steel, e.g. main reinforcements, *2* and spacing reinforcements, *4* are provided; in the case of the arched roof or structure ties, 3 of bamboos, M.S. bars or C.G.I. sheets or the like are provided.

While constructing an arched roof corrugated sheet bearing plates, *9* are provided near the springing block *4*, on the supporting wall, *5* at either end and tied in position with the ties, so that the connection between the tie and the hollow tile arch is purely provided to ensure the arched roof functioning as a two hinged arch structure. The arch is completed with the key block, 2.

54394. 3 May 1955: **Boron free ground coat enamels**—Atma Ram and S. S. Verma, CGCRI [Group XXXVI].

Boron free ground coat enamel compositions comprise the following: (i) One or more refractory oxides such as silica (SiO_2), titania (TiO_2), alumina (Al_2O_3); (ii) One or more fluxing oxides and fluorides such as sodium oxide (Na_2O), potassium oxide (K_2O), zinc oxide (ZnO), calcium fluoride (CaF_2), cryolite (Na_3AlF_6); (iii) one or more adherence oxides such as cobalt oxide (CoO), nickel oxide (NiO), manganese dioxide (MnO_2), wherein barium oxide is incorporated.

The process of making boron-free ground coat enamel consists broadly in fritting the materials contributing the oxides, fluorides and sulphides mentioned above and milling the frit along with mill additions like clay, bontonite, quartz, titania, electrolytes such as sodium nitrite, and magnesium sulphate and ingredients such as sodium thiosulphate, urea, gum tragacanth.

54395. 3 May 1955: **A process for the manufacture of active manganese dioxide suitable for dry batteries**—U. C. Agrawala, N. R. Sanjana and J. Gupta, NCL [Group III].

A process for the manufacture of manganese dioxide in a form suitable for dry batteries, consists in the oxidation by chlorine of an ammoniacal suspension of manganese hydroxide. Manganese hydroxide is prepared from a manganous salt such as manganous sulphate by precipitation with ammonia. Thus the manganese salt solution is first treated with an excess of ammonia at room temperature (30–35°C) to precipitate the hydroxide, and then chlorine gas is passed into the suspension at the boiling temperature of the liquid. The precipitate is dried at 100–110°C to give a soft black product containing not less than 77% MnO_2, predominantly of the 'gamma' structure as revealed by X-ray diffraction.

54433. 9 May 1955 : **Copper enamels**—Atma Ram and S. S. Verma, CGCRI [Group XXXVI].

The invention relates to enamel compositions for use on copper metal. The composition consists of frit and mill addition wherein the frit comprises by weight 15–25·0% of Na_2O, K_2O; 10·0–20·0% of one or more of the oxides of BaO, CaO, MgO, or ZnO; 0–5% of PbO; 0–6·0% of Al_2O_3; 0–5% of As_2O_3; 30·0–45·0% of SiO_2; 0–8·0% of TiO_2; 0–8% of Sb_2O_5; 0–10% of F_2 and 0–15% of B_2O_3.

The enamel may also be composed of two or more premelted frits and process of their manufacture comprises by preparing two or more frits by melting the ingredients at 900–1100°C. Combining them in mill to obtain a predetermined composition with or without adding opacifiers in the mill and then applying and firing them.

54604. 30 May 1955 : **A process for the removal of pink colour and offensive smell from solid lake bitterns**—Mata Prasad, D. J. Mehta and R. K. Sapre, CSMCRI [Group III].

Pink colour and offensive smell from solid bitterns are removed by carbonizing the bitterns, leaching the carbonized bittern with water and filtering the solution whereby a clear filtrate is obtained. The carbonization is carried at 500°C under current of air for 1–1·5 hr. Preferably sambhar lake solid bitterns are employed. Inorganic chemical compounds are obtained from the bitterns.

54650. 6 June 1955 : **Process for the removal of pink colour from lake brines**—Mata Prasad, D. J. Mehta and R. K. Sapre, CSMCRI [Group VI].

The invention relates to a method for the removal of pink colour from sambhar lake brine. The method consists in passing the brine through untreated or treated cellulose or paper pulp filters, the cellulose or paper pulp is treated with a dilute solution of soap and/or alkali and thereafter washed free with water for use in filtration. The brine may be subjected to multiple filtration in one stage by passing it through a tower having perforated plates covered with cellulose or paper pulp as filtering medium. Reference is made to Indian Patent No. 53348.

54676. 9 June 1955 : **An improved method for the preparation of metallic iodides, particularly titanium tetraiodide**—P. P. Bhatnagar and R. A. Sharma, NML [Group III].

Titanium tetraiodide is prepared by reacting titanium dioxide with iodine and aluminium in a reaction vessel sealed under vacuum. The reaction vessel is of borosilicate heat resisting glass or silica. The vessel is first heated gently to 100–125°C and thereafter the temperature is raised to 400–450°C and maintained for 6–8 hrs. or longer. After the reaction, the pure titanium tetraiodide is separated from the reaction mixture by extraction with an organic solvent such as absolute alcohol or carbon disulphide. Indian Specification No. 49234 has been referred.

54713. 13 June 1955 : **Extraction of fluorine in a soluble form alkaline earth fluorides**—M. M. Singh and J. Gupta, NCL [Group III].

A process for obtaining alkali fluoride from an alkaline earth fluoride or a fluorine bearing mineral like fluorspar consists in reacting at an elevated temperature of 600–1000°C the fluorine bearing compound or mineral with an alkali carbonate in presence of a naturally occurring mineral of titanium dioxide such as rutile or ilmenite or a mixture of titanium dioxide and iron oxide. The time of reaction at elevated temperature varies from 4 hr.–100 min. The alkali fluoride formed is extracted with boiling water.

54828. 27 June 1955 : **Process for the manufacture of triammonium phosphate**—K. Seshadri and J. Gupta,NCL [Group III].

Triammonium phosphate is obtained by treating trisodium phosphate with ammonium bicarbonate or carbonate in solution and precipitating out the resulting triammonium phosphate by passing gaseous ammonia.

The reactants are in stoichiometric ratio and the mixture is allowed to stand at room temperature for one hour. Gaseous ammonia is passed at 40—60°C leaving sodium carbonate in solution.

54829. 27 June 1955: **Process for the manufacture of an ammonium phosphate fertiliser from triammonium phosphate**—K. Seshadri and J. Gupta, NCL [Groups I (4) and III].

Ammonium phosphate fertiliser is manufactured by stabilizing triammonium phosphate by fixing the labile ammonia thereof by reacting the triammonium phosphate with an acid such as sulphuric, nitric, hydrochloric or phosphoric acid or an acid salt such as potassium bisulphate, triammonium phosphate obtained according to process disclosed in Indian Patent Specification No. 54828 is preferably used.

54867. 2 July 1955: **A process for the manufacture of nicotine sulphate from tobacco and tobacco wastes**—H. C. Bijawat, R. Razdan and G. V. Potnis, NCL [Group IX(1)].

A process for the manufacture of nicotine sulphate which consists in directly extracting wet alkali-treated tobacco with an organic solvent such as kerosene, benzene, chlorobenzene, toluene, xylene, ethylene dichloride, cyclohexane or mineral turpentine and reacting the nicotine-burdened organic elute thus obtained with sulphuric acid. The wet alkali treated tobacco is obtained by mixing the tobacco or tobacco waste with soda ash and water. Preferably the pulverised tobacco or tobacco waste is mixed with atleast 20% by weight of soda ash and the mixture is wetted with just enough water to get a uniformly wet mixture which is loosely packed into percolators. The extraction with the organic solvent is effected by percolation. The solid residue is pressed for the recovery of residual organic elutant. The denicotinised organic elutant is distilled and the distilled elutant re-used for extraction of further quantities of tobacco powder. Approximately up to 95% of the total nicotine present in the tobacco or tobacco waste is obtained as nicotine sulphate

54907. 8 July 1955: **An under reaming tool**—Dinesh Mohan and G. R. S. Jain, CBRI [Group III(3)].

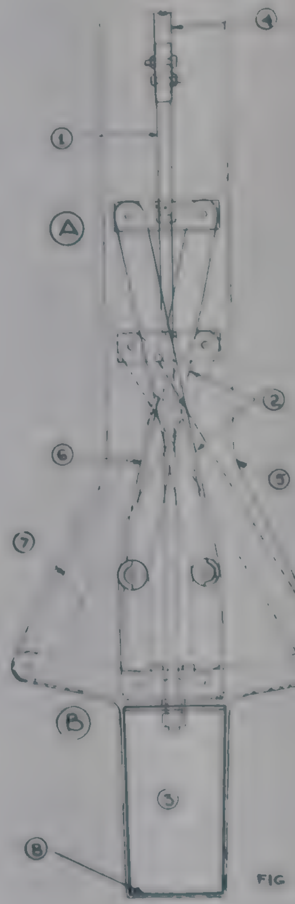
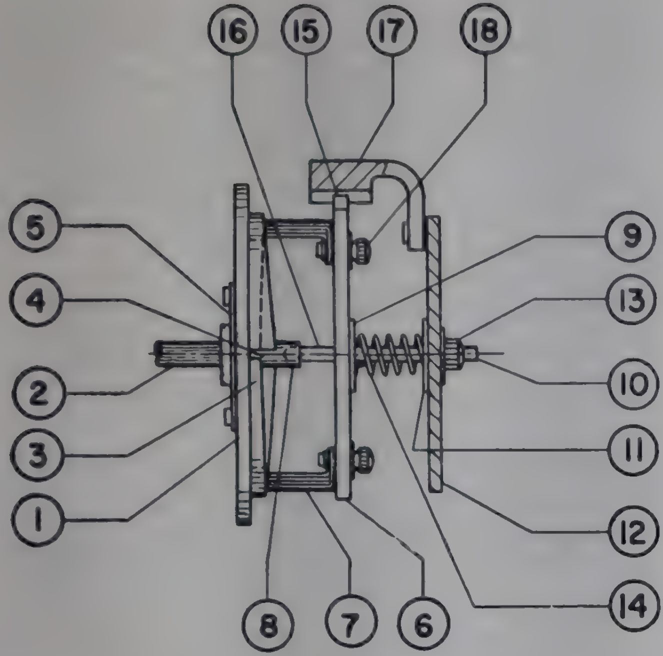


FIG 1

An under-reaming tool consists of a guide rod, 1 fixed at its upper end to a socket, 12 carrying flats, 3 holding cutting blades, 2 which expand and rotate when the rod is pressed and rotated and can thereby effect widening of pipe base hole when the tool is lowered into the hole and the guide rod, I is fixed at the lower end to a cylindrical container, 3 for removal of the soil cut out by the blades, 2.

54959. 18 July 1955: **An electrical Device for double action on off control**—S. L. Sastri, NCL [Group LIX(1)].

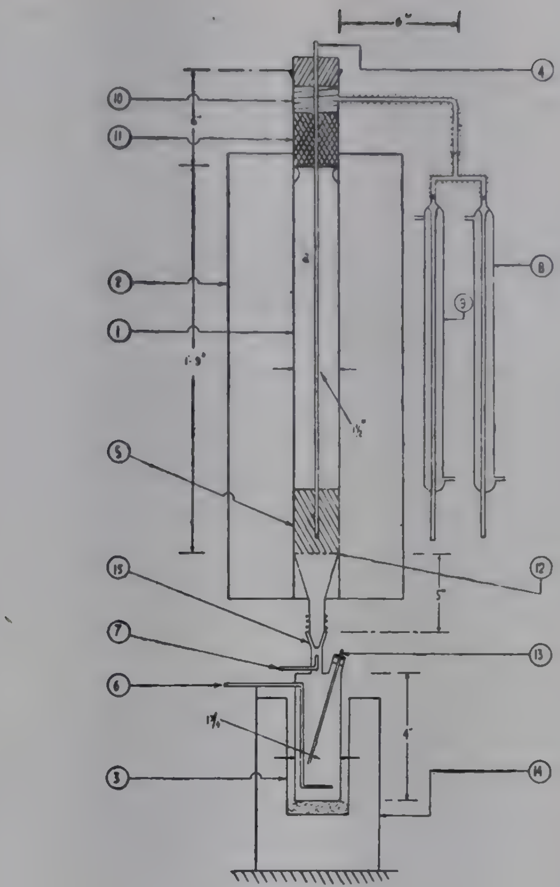
Relates to an electrical device for double action on/off control of process variables which affords a time-action and/or a direction-action. It comprises a rotating plate or disc, 1 with two half ring cams, 3 of equal dimension in mutual electrical contact so mounted that the thick end of one follows the thin end of the other and two electrical contactors, 7 carried by a non-rotating disc or plate, 6 which can be moved



towards or away from the cam face of the rotating plate or disc in accordance with the change in the controlled process variable, the said contactors being so made and mounted that they simultaneously contact the cams. The rotating plate or disc may be provided with additional cams. The cams may be contacted by one or more pairs of contactors. For movement towards or away from the cam face the non-rotating disc or plate, 6 is moved by a screw engaging a knob, 13 or nut, or by a push rod which receives its actuating force from measuring instruments responsive to process variables.

The inclusion of the above-said device in an electrical heating circuit will switch the circuit periodically, thereby regulating the energy input to the heating element. The said device may be used to alternately energize and de-energize electrically driven valves that control the flow of fluids. A further application is the control of the average output of a compressor or a pump or such other motor driven mechanism whose motor is turned on and off by the device and consequently pressure, fluid flow or such other process variable controlled.

54960. 18 July 1955: **A process for the production of phthalic anhydride**—V. K. Mathur, C. S. B. Nair, A. N. Basu and A. Lahiri, CFRI [Group IX(1)].



Relates to a process for the manufacture of phthalic anhydride which consists in the oxidation of one or more of the following reacting substances, which are coal tar hydrocarbons, phenanthrene, neutral coal tar oils (frac. 230—360°C), crude anthracene cake from coal tar, and wherein the oxidation is carried out in a fluidized bed of solid catalyst having the following composition:

Vanadium pentoxide, 11—13%; potassium sulphate, 2-3% and silica gel, 84—87%. The vapours of the reacting substance and air are brought in contact with a solid catalyst which is maintained in a fluidised condition at 430-450°C. The apparatus for carrying out the process, consists of a vertical pyrex glass reactor tube, 1 containing the catalyst bed, *5* and placed inside are electrically heated furnace, *14*, a carburetter, *3* containing the material to be oxidised, a ground glass joint connecting the reactor to the carburetter, a primary air inlet, *6* to bubble air through the molten material in the carburetter and carry the vapours of the reacting material into the reactor and an inlet *7* for secondary air to be blown simultaneously into the reactor.

54998. 21 July 1955: **An improved process for the production of enzyme bates for leather manufacture**—S. Bose, S. C. Dhar and B. M. Das, CLRI [Groups IX(1) and XXIV (3)].

The process of preparing enzyme bates consists in growing the mold, namely, *Aspergillus oryzae*, *Aspergillus parasiticus* or *Aspergillus flavus* on a culture medium to secrete very active proteolytic enzymes in the medium and mixing up the mold and the entire culture medium to produce a mixture comprising the enzymes, the mold and the medium. The medium is composed of wheat bran, tapioca flour, commercial lactic acid and water sufficient to make a semi-solid pasty mixture.

Example

A suspension of the mold spores in sterile water is prepared and added over the surface of the medium comprising wheat bran (100 parts), tapioca flour (100 parts), commercial lactic acid (3 parts) and water to make a semi-solid pasty mixture. The inoculated medium is kept at 32–33°C for about 48 hr. and is then stored at a 26–31°C. for 5–7 days. After the profuse growth of the mold, the mixture is spread in aluminium trays, dried by blowing warm air (43–45°C.) and finely powdered in a grinding mill. Reference has been made to Indian Specification No. 52670.

55171. 12 August 1955: **Treatment of anacardic material such as cashew-nut shell liquid for use in electrical insulating varnishes**—K. G. Thakar and J. Gupta, NCL [Groups IX(1) and XII(3)].

Cashew-nut shell liquid is treated to render it suitable for use in electrical insulating varnishes by condensing the liquid with an alkyl ortho-ester such of fusel oil titanate silicate. A paraformaldehyde condensation product of cashew-nut shell liquid is used. The product after condensation is further cooked with a drying oil with or without further mixing with gilsonite and/or bitumen dissolved in a mineral solvent.

55172. 12 August 1955: **A process for the utilization of waste cinematographic films**—K. G. Mathur and A. M. Lele, NCL [Group LVIII (5)].

A process for the metallization of waste cinematographic films (cellulose ester base) consists in first coating the washed film with silver (silver under coat), and then coating with suitable metal such as, copper, nickel, gold or silver. Prior to silvering the cellulose base film is sensitised by immersion in a sensitizing mixture consisting of:—

$SnCl_2\ 2H_2O$	10 gms
Conc. HCl	10 c.c.
H_2O	1000 c.c.

55289. 27 August 1955: **A process for the hot-dip aluminizing of ferrous materials**—A. N. Kapoor, A. B. Chatterjee and B. R. Nijhawan, NML [Group XXXIII (9)].

The invention relates to a process for hot-dip aluminizing ferrous material by hot-dipping the said materials in a molten bath of aluminium. The process is characterized in that prior to aluminizing, the said materials are dipped in a molten flux comprising zinc chloride, 10–15%; sodium chloride, 30–35%, potassium chloride, 35–40%, aluminium fluoride, 5–10%, cryolite, 10–15% and barium chloride (optional) upto 10%. If desired calcium chloride may also be added to the flux bath. The flux bath is maintained at 600°–700°C. The oxidation of the exposed surface of the molten aluminium bath is eliminated by adding a mixture of cryolite and sulphur or cryolite alone or covering the molten aluminium bath with the flux mixture. The molten flux and the aluminium bath may be both held together in a receptacle pot. The article is immersed in the molten aluminium bath maintained at 675°–725°C for 15–45 sec. depending on the thickness of coating required. Addition of 5% silicon introduced as commercial purity silicon metal containing over 95% Si or as master alloy of aluminium and silicon containing 20% Si with or without 0·25% titanium which is introduced as master alloy of aluminium and titanium containing 10–15% titanium with 0·5% Max. Iron, serves to diminish the thickness of the brittle Fe-Al compound alloy layer and effects an over-all improvement in the ductility of the aluminized material.

55423. 19 September 1955: **Improvements in or relating to the dehydration**

of castor oil—M. A. Sivasamban, S. A. Saletore and S. H. Zaheer, RRL, Hyderabad [Group XI(1)].

Heating refined oil to 225–240°C in absence of air and adding sodium sulphite sodium bisulphite and sodium sulphate.

55452. 22 September 1955 : **Manufacture of neutral glass**—Atma Ram and S. Kumar, CGCRI [Group XXXVI].

The invention relates to the manufacture of neutral glass without the use of boric acid. The glass has ingredients in the range of 6–12% by wt. of alumina (Al_2O_3), 2–6% by wt. of zinc oxide (ZnO), 4–9% by weight of calcium oxide (CaO), 2–6% by weight ofmagnesium oxide (MgO), 3·5–7% by weight of potassium oxide(K_2O), 2·5–6% by weight of sodium oxide (Na_2O) and balance is silica (SiO_2).

The glass is thus obtained by melting together of such raw materials as sand, felspar, dolomite, pyrolusite, borax, soda, potash nitre to have the ultimate chemical analysis composition as stated above.

Alternatively the composition of glass may be 0–5% by weight of boric oxide (B_2O_3); 0–4% by weight manganese oxide (MnO), 0–0·5% by weight of iron oxide (F_2O_3); 0–1·0% by wt. of titanium oxide (TiO_2) 0–0·3% by wt. of fluorine (F) and 0-0·2% by wt. of arseneous oxide (As_2O_3).

55453. 22 September 1955 : **Improvements in or relating to the manufacture of copper ruby glass articles**—Atma Ram, S. N. Prasad and V. K. Vaish, CGCRI [Group XXXVI].

The invention relates to process for the manufacture of copper ruby glass articles like bangles, tubes or hollow-ware or pressed-ware from glass of composition described in Indian Patent No. 51847.

The process consists in making a parison having more than one layer of glass, the inner layer being of colourless glass having approximately the same thermal expansion as that of the next layer so as to prevent cracking wherein the outer most layer is of copper glass of the above mentioned composition wherein the articles are formed by drawing or blowing or both or by pressing, wherein the fabricated articles although containing the red colouring agent is not red and wherein the red colour is developed by heating the articles to a 450–750°C for 1–60 min. A layer of white opaque glass may also be introduced inside or outside the inner layer.

55454. 22 September 1955 : **A process for wet grinding of mica**—Atma Ram and S. B. Roy, CGCRI [Group XXXIV(2)].

A process for the wet grinding of mica, consists in wet grinding the mica in an edge runner type mill comprising a mill pan and grinding rollers, characterized in that the grinding roller and the mill pan are both lined with wood and is adapted to exert a minium pressure of about 10 lb./sq. in. on the mica to be ground.

In the grinding process an amount of water not less than 65–70% of the amount of mica is employed and the same is added in small instalments. The process of grinding may take from 8–12 hr. per charge of mica and thereafter all foreign materials may be removed by water-flotation and settling.

55504. 30 September 1955 : **A process for the preparation of long-chain unsaturated ketones and 1-ω ketodicarboxylic acids from the said ketones**—K. K. Chakravarti and S. C. Bhattacharyya, NCL.

55510. 30 September 1955 : **A process for preparing foamed concrete**—D. P. Ahuja & N. K. Patwardhan, CBRI.

55546. 5 October 1955 : **Improvements in or relating to ion exchange materials**—C. S. Ramakrishnan and N. R. Krishnaswamy, NCL [Group IX(1)].

Ion-exchange materials are obtained by dispersing a fine suspension of an ion-exchange resin in stabilized rubber latex or a polymer having rubber like properties. The ion-exchange resin may be formed *in-situ* in stabilized latex.

For e.g. rubber-phenol-sulphonic acid formaldehyde membrane is prepared as follows :

A composition containing the following ingredients is cured at 90°C for 2–2·5 hr.

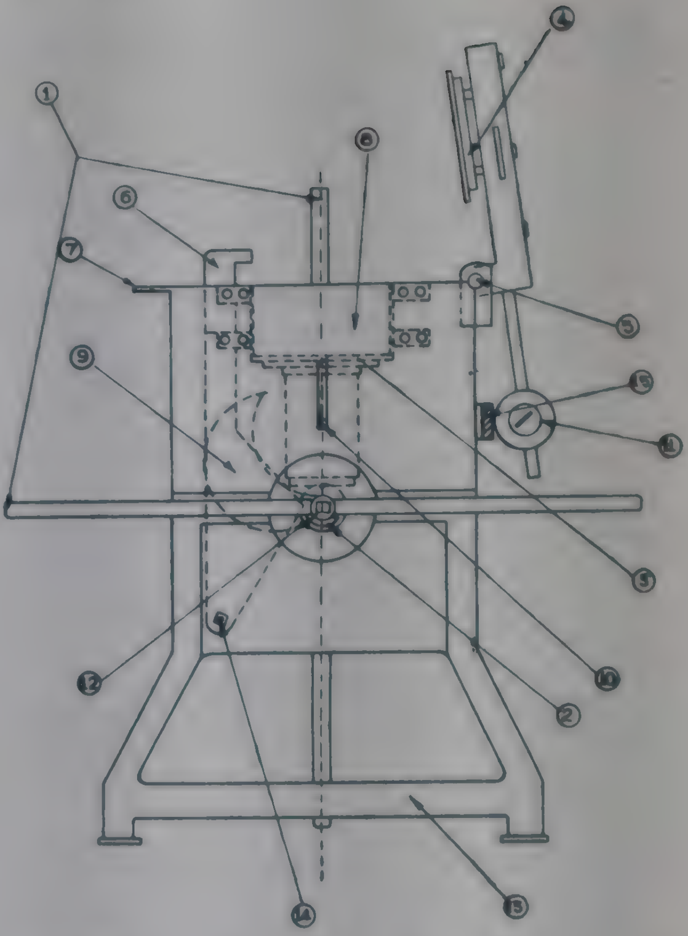
Natural rubber latex 50% DRC, 22 g.; "Vulcastab L.W", (5%) 10 c.c., Vulcanising mixture, 2 g.; Phenol-sulphonic acid formaldehyde resin, 30 g.; and Water, 10 g.

55559. 7 October 1955 : **Modification of a process for the utilization of waste mica for the manufacture of insulating bricks, slabs, tiles or the like**—Atma Ram and S. B. Roy, CGCRI [Group XII (1)].

This invention which is modification of the process claimed in Specification No. 48667 relates to a process for the utilisation of mica and micaceous substances particularly for the manufacture of insulating bricks, slabs, tiles or like products from waste mica. The process which consists in mixing pulverised mica or micaceous substances with a binder, shaping the mixture, drying the shaped product and heating it is characterised in that the shaping of the mixture is done either without the application of pressure or with the application of light pressure not exceeding 100 lbs./sq. in., and that the heating of the dried moulded is effected at a temperature which is high enough to soften the binder but not high enough to melt it. The mica or micaceous substances are pulverized to a size ranging from 20—100 mesh.

55602. 12 October 1955 : **A brick or block making machine**—Dinesh Mohan and D. S. Bhatnagar, CBRI [Groups XIII and XXV(1)].

This invention relates to brick or block making machine, working on continuous cycles of operation. This brick or block making machine comprises a base frame, 13 and a cam or crank arrangement mounted thereon for compression of soil in a mould/s, 8 by piston/s in blocks, 3 and ejection of the brick/s or block/s formed therein. A crank shaft, 12 operated by handles, 1, pushes up the piston block, 3, thereby compressing the material in the mould, 28, A crank, 2 operates the locking lever, 6 thereby releasing the lid, 4 after compression is over. The lifting cam, 9 comes into operation then and raises pistons and forces out the brick or block out of the mould. 8.



55757. 3 November 1955 : **A process for the preparation of long chain unsaturated ketones and 1-W ketodicarboxylic acids from the said ketones**—B. Menon, U. G. Nayak, R. K. Razdan, K. K. Chakravarti and S. C. Bhattacharyya, NCL [Group IX(1)].

A process for the preparation of long-chain unsaturated ketones and 1-ω-ketodicarboxylic acids from the said ketones consists in hydrolysing a ketone dimer of an unsaturated monocarboxylic acid halide and converting through oxidation the ketone thus obtained to the corresponding keto-dicarboxylic acid.

For e.g., undec-9-yonic acid (2 g.) was treated with thionyl chloride (1 c.c.) and heated on a water bath for 2 hr. Any excess of thionyl chloride was then removed under suction. The residual acid chloride was dissolved in an anhydrous solvent like ether or benzene (15 ml). To this solution triethyl amine (1·5 g.) was added. The mixture was left at room temperature overnight. The precipitated triethylamine hydrochloride was removed by filtration. The filtrate was freed from the solvent under reduced pressure and residual ketone dimer was refluxed with alcoholic potash (15 ml, 20%) for 4 hr. on dilution with water, the unsaturated ketone separated as a solid material. It was purified by crystallisation from alcohol m.p. 61°C.

55768. 7 November 1955 : **A process for arresting the fermentation of vegetable tanliquors**—Y. Nayudamma and J. B. Rao, CLRI [Group XXIV(3)].

A process for arresting the fermentation of vegetable tanliquors consists in treating the tanliquors with cloves. Suitable examples of tanliquors are Divi-Divi, Myrobalan or Dhawa. 3 to 4% of cloves are preferably added on the weight of the total solids of tanliquors.

55816. 15 November 1955 : **Improvements in or relating to the removal of sulphur from industrial gases**—N. G. Basak, A. C. Majumdar and A. Lahiri, CFRI [Groups IV(1) and XLVII(4)].

A method of purifying industrial gases by removing the inorganic sulphur compounds contained therein by passing the said gases over a catalyst prepared by the reaction of ferrous sulphate and lime and atmospheric oxidation of the resulting product to form calcium sulphate. The temperature during the purification is not allowed to rise above 110°F. and is controlled by regulating gas flow as well as circulating cold water around the absorption tower. For efficient working of the catalyst, the following space velocities have been found suitable. For coal gas it is 50-150 per hr. while for water gas or producer gas it is 150—250 per hr. The catalyst is prepared by mixing crushed ferrous sulphate with lime, initiating the reaction between two substances by sprinkling water on the mixture and allowing the reaction product to be oxidised by atmospheric oxidation so as to convert ferrous hydroxide formed into Fe_2O_3 and lime into calcium sulphate.

55817. 15 November 1958 : **Improvements in or relating to the removal of sulphur from industrial gases**—N. C. Basak, A. C. Majumdar and A. Lahiri, CFRI [Groups IV(1) and XLVII(4)].

A method of removing organic sulphur from industrial gases, which method consists in passing the said gases over a catalyst consisting of copper chromite supported on alumina. The catalyst is prepared by mixing together a solution of copper sulphate with a solution of sodium dichromate, adding ammonia to the mixture of the two solutions slowly in the cold so as to precipitate the complex salt, filtering and drying the said precipitate, thereafter powdering it and mixing it intimately with alumina, moistening the resulting mixture and pelleting it by a pelleting machine.

55818. 15 November 1955 : **Manufacture of gold and silver leathers**—A. I. Ganesan, CLRI.

55819. 15 November 1955 : **Manufacture of gold and silver leathers**—A. I. Ganesan, CLRI.

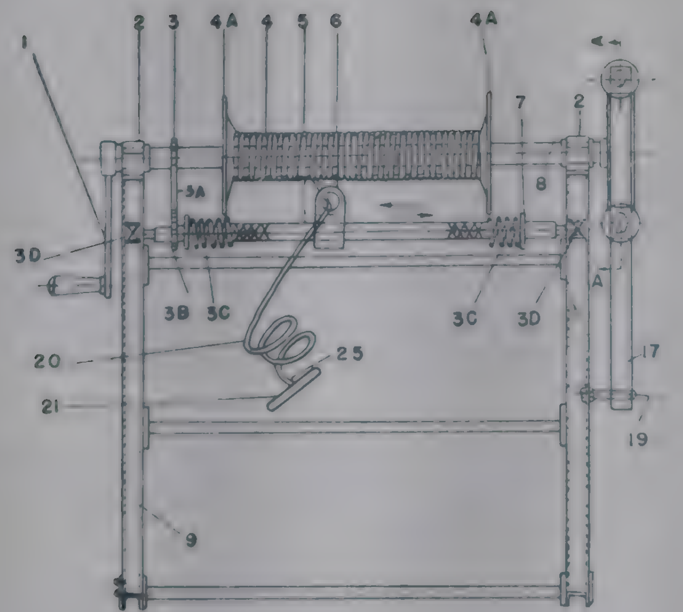
52635. 5 January 1956 : **Preparation of titanium hydride**—S. Ramamurthy, BHU.

56251. 7 January 1956 : **A curing agent for raw hides and skins**—S. N. Sen, S. C. Nandy and B. M. Das, CLRI [Group XXIV(3)].

A curing agent for raw hides and skins is composed of a mixture of sodium sulphate, magnesium sulphate and ammonium sulphate. The salts are mixed in the following proportions : Sodium sulphate, 35; magnesium sulphate, 40; and ammonium sulphate, 25 parts.

56310. 14 January 1956 : **Device for testing the horse-power, pulling capacity and/or endurance of animals or moving bodies**—V. Cadambe and C. R. Gupta, NPL [Groups I(2) and XLI (6)].

Relates to a device for measuring a testing the horse-power, pulling capacity and/or endurance of animals or moving bodies comprising a drum, 4 mounted on a fabricated frame work, 9. The shaft, 8 of drum, 4 rotates in bearings, 2 and the rope, 20 is tied to yoke 21 through link, 25. One shaft, 8 is a dynamometer comprising a ratchet wheel, 13 having a collared pulley, 12 over which wooden brake, 11 is attached, having two wooden frames, 11-A with long arm, 17 which is hooked to spring balance, 10



through hook, 18. The dog engages the outer periphery, 14 of ratchet wheel, 13 thus moving the collared pulley, 12. At this instant, the wooden brake, 11 is adjusted by hand, by operating nuts, 23 closing the wooden brake frames 11 A for exerting pressure on the outer periphery of the collared pulley, 12 through replaceable type wooden liners, 12 A. As the brake, 11 is tightly pressed against the collared pulley, 12 the wooden lever, 17 tries to move the spring balance, 10 through hook, 18, indicating the pressure in lb.

56322. 17 January 1956 : **An improved process for the manufacture of vinyl chloride from ethylene dichloride**—R. K. Bhatnagar and N. R. Kuloor, SRIFIR [Group IX(1)].

Vinyl chloride is obtained by dehydrochlorination of ethylene dichloride using a catalyst mass consisting of finely divided pieces of activated bauxite. The catalyst mass is maintained totally or partially in an agitated state by ethylene chloride or its dehydrochlorination products.

For e.g., (1) through a one inch I.D. Pyrex glass tube containing 140 c.c. of a fluidized column of activated bauxite maintained at 350°C superheated vapours of ethylene dichloride obtained by evaporation of 8 c.c. of ethylene dichloride per minute are introduced. Evolved reaction gases are rapidly chilled and the unconverted ethylene dichloride collected. Percentage conversion to vinyl chloride and hydrochloric acid is 51% during the 1st half hour of the operation.

56391. 27 January 1956: **A process for the preparation of civetone dicarboxylic acid (8-keto-pentadecane 1 : 15 dicarboxylic acid)**—U. G. Nayak, K. K. Chakravarti and S. C. Bhattacharyya, NCL [Group IX(1)].

Process for the preparation of civetone dicarboxylic acid (8-keto-pentadecane-1 : 15-dicarboxylic acid), consists in the oxidation of the ketotetrol, 18-keto-9, 10, 26, 27-tetrahydroxy-pentatriacontane, using on oxidising agent such as potassium permanganate, lead tetracetate, sodium meta-periodate, chromic acid, hypohalites, silver oxide or the like. For e.g., to a cooled solution of ketotetrol (5g.) in alcohol (50 c.c.) was added under stirring an aqueous solution of sodium meta per iodate (5g.). The reaction product was steam distilled to remove pelargonic aldehyde. The residual product was oxidised with aqueous solution of $KMnO_4$ (3g.) to yield civetone dicarboxylic acid.

56532. 13 February 1956 : **A new technique for the electrolytic preparation of cuprous oxide**—B. B. Dey, H. V. K. Udupa, S. Sampath and R. Viswanathan, CECRI [Groups III and LVIII(5)].

The invention relates to a process for the electrolytic preparation of cuprous oxide by a new technique. The process consists in electrolysing a solution of sodium chloride and an alkali in a cell with sheet copper as cathode and refined or pure copper as anode and wherein the state of motion of the anode is specified, viz. that it is rotating. The preheated electrolyte containing not less than 10% sodium chloride by weight and 0·3–5 g. per litre alkali is fed into the cathode chambers of an electrolytic cell in which sheet copper is used as cathode and pure or refined copper as rotating anode. The rate of flow of the electrolyte is such that the alkalinity of the bath is always maintained at the specific optimum range, viz. 0·3–5 gpl expressed as sodium hydroxide.

56581. 22 February 1956 : **Preparation of a resin from tar oil fractions**—

C. S. B. Nair, A. N. Basu and A. Lahiri, CFRI [Group IX(1)].

A process for the preparation of a resin from tar oil fractions which consists in condensing with an aldehyde such as formaldehyde an alkali extract of tar acids from the tar oil fractions. The reaction is carried out in aqueous medium. The tar oil fractions are preferably an alkali extract containing crude tar acids of lighter and middle tar oil fractions of coal tar or wood tar.

56582. 20 February 1956 : **A process for the manufacture of light constructional material such as hard boards laminates, blocks or the like**—C. S. B. Nair, A. N. Basu and A. Lahiri, CFRI [Group XII(1) and XIII].

A process for the manufacture of light constructional material, such as hard boards, laminates, blocks or the like which consists in subjecting to heat and pressure fibrous and/or granular material impregnated with a resin obtained by condensing with an aldehyde an alkali extract of tar acids from tar oil fractions of coal tar or wood tar. The fibrous material consists of cotton, cotton waste, jute, jute-waste, bamboo pulp, wood pulp, asbestos, glass wood, and the granular material consists of kieselguhr, kaoline, coal dust, coal ash, shale powder. The pulp of the fibrous material is soaked in water and a resin solution of strength varying from 3–30% and the tar-acid aldehyde resin is precipitated by dilute mineral acid on the pulp. Reference is made to Indian Specification No. 56581.

56703. 2 March 1956 : **A reinforced bamboo structure**—V. S. Goel, CRRI.

56704. 2 March 1956 : **A novel bearing**—V. S. Goel, CRRI.

56705. 2 March 1956 : **Low melting resistant glass compositions**—A. Ram, S. N. Kumar and P. Nath, CGCRI [Group XXXVI].

A low melting chemically resistant glass composition comprises by weight 60–65% of SiO_2, 5–11% of R_2O_3 (Al_2O_3–iron expressed as Fe_2O_3); 8–12% of RO; 3–5% of K_2O; 7–15% of Na_2O; 0–3% of B_2O_3; 0–0·3% of F; 0–0·3% of arsenic as AS_2O_3; 0–5% of titanium as TiO_2 and 0–2% of P_2O_5 where RO is CaO, MgO, ZnO, or MnO, PbO. In addition of CaO and MgO, which may be present in molecular ratio, not less than 1% but not more than 5% of at least one of the following oxides may also be present i.e. ZnO, BaO, MnO and PbO. The batch is melted at 1250–1350°C and a part of the soda may be introduced as sodium nitrate and/or sodium sulphate, to have the following ultimate chemical composition by weight i.e. 63·5% of SiO_2; 6·0% of Al_2O_3; 1·0% of Fe_2O_3; 2·1% of MnO; 5·0% of CaO; 3·6% of MgO; 3·3% of K_2O; 12·6% of Na_2O; 2·5% of B_2O_3; 0·1% of F and 0·2% of As_2O_3.

56724. 5 March 1956 : **A water dispersible DDT paste**—K. V. N. Rao, S. P. Bhide, S. B. Kulkarni and A. B. Biswas [Group XIX(1)].

In a process for the preparation of a water dispersible D.D.T. paste in the form of an aqueous paste, a mixture of D.D.T., saponin and water is heated and saponin is incorporated as the dispersing agent. Saponin is extracted in an aqueous medium from a soapnut such as *Ritha*.

For e.g., a mixture of 100 parts of Technical D.D.T. (i.e., commercially produced D.D.T. containing about 75% of pp. isomer, the rest being impurities and other isomers of D.D.T.), 10–30 parts of Ritha extract, 20–40 parts of water is heated to 95°C till the D.D.T. melts. The hot mixture is stirred vigorously for 2–3 min., when it swells. It is transferred to a container and allowed to cool when a thick cream-white paste containing needle shaped D.D.T. crystals is obtained. This paste contains 67% technical D.D.T. and forms on dilution with water, a stable suspension with a suspensibility of the order of 90 to 95%.

56725. 5 March 1956 : **A new process for the purification of selenium**—D. N. Sen and J. Gupta, NCL [Group XXXIII (7)].

A process for purification of commercial selenium consists in dissolving the selenium in a warm (60° to 85°C) solution of an alkali metal sulphite and adding the alkali selenosulphate solution slowly into dilute mineral acid whereupon pure selenium is precipitated out. The precipitation is carried out at *p*H between 5 and 6.

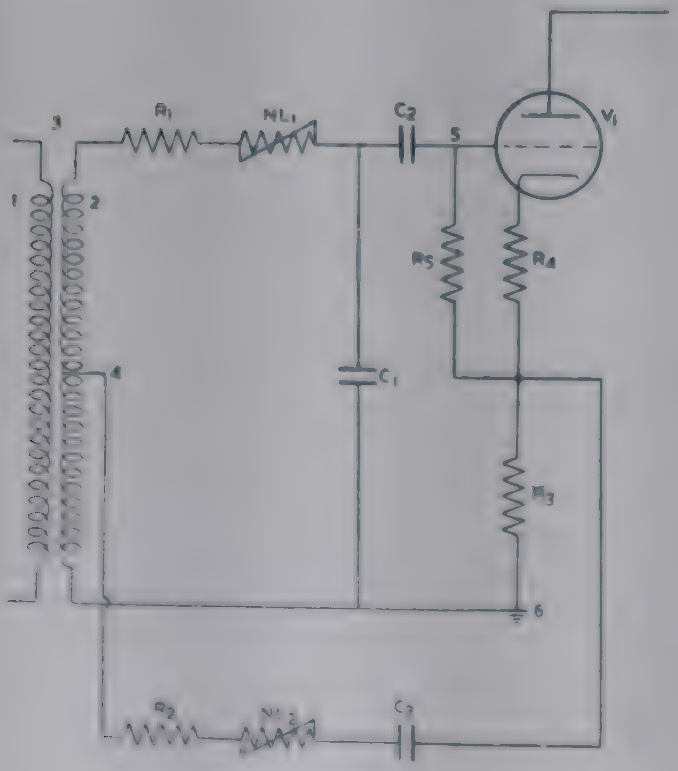
56726. 5 March 1956: **Preparation of water dispersible DDT as an oil bound paste**—K. V. N. Rao, S. P. Bhide, S. B. Kulkarni and A. B. Biswas, NCL [Group XIX(1)].

A DDT paste comprises between 45 and 89% of technical DDT, a non-ionic type of wetting agent and lubricating oil.

Example

A mixture of 100 parts of technical DDT, 5—15 parts of waste lublicating oil and 7—10 parts of a non-ionic oil soluble wetting agent such as an alkalated phenol ethylene oxide condensate, is ground in a suitable grinder till a fine paste with DDT particles 5—25 microns in size, is obtained. The resultant product is a dark yellowish brown paste which on dilution with water forms a cream-white suspension, suitable for spraying.

56817. 14 March 1956: **An improved compensator for transformers**—P. V. Rao, Indian Institute of Science [Group LVII(2)].



A compensator for transformers for the purpose of improving their accuracy by maintaining a high degree of compensation of the magnetising current over any desired working range, has in combination the usual secondary compensator winding 2, a phase shifting network, R1, NL1, C1: a cathode follower circuit VI, and an amplitude controlling circuit 'R_2, NL_2, C3'. It is characterised in that the said amplitude controlling circuit is connected on the output side of the cathode follower circuit.

56818. 14 March 1956: **An improved process for the manufacture of vinyl chloride from ethylene dichloride**—R. K. Bhatnagar, N. R. Kuloor, SRIFIR [Group IX(1)].

Process for manufacturing vinyl chloride consists in passsing superheated vapours of ethylene dichloride through a fluidised catalyst bed consisting of inert non-porous substances e.g. powdered glass, quartz sand, carborundum, maintained at 350—380°C.

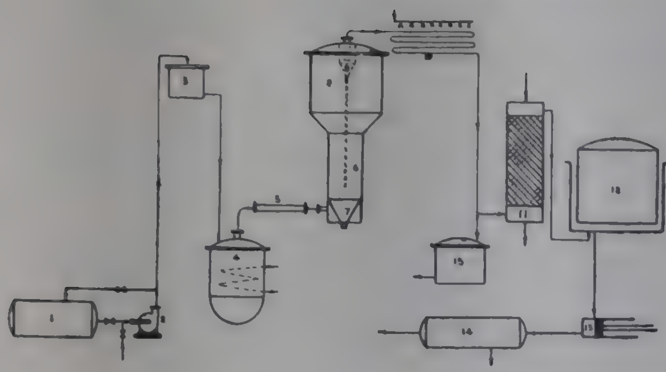
Example

A steady stream of superheated vapours of ethylene dichloride obtained from 590 c.c. of liquid ethylene dichloride per hour was passed through a catalyst bed consisting of 130 c.cs. of +20—30 pyrexglass powder for 10½ hours. The overall conversion of ethylene dichloride to vinyl chloride after 4½ hours' run was found to be 83·5% and hardly any carbonaceous deposition was noticed in the catalyst bed.

56935. 28 March 1956: **Manufacture of ethylene dichloride**—R. K. Bhatnagar, N. R. Kuloor and D. N. Daruvalla, SRIFIR [Group IX(1)].

A modification of the process for the manufacture of ethylene dichloride described in Indian Patent No. 51958, which modified process consists in passing ethylene and chlorine under normal atmospheric or higher pressures in a vertical tube reactor, wherein a stream of cooled ethylene dichloride is showered from the top and wherein the ethylene dichloride is cooled to 80—120°F, before it is showered into the reactor.

57007. 7 April 1956: **A process for the preparation of ethylene from ethyl alcohol**—V. V. Deshpande, R. K. Bhatnagar, S. Venkataraman, N. R. Kuloor and D. N. Daruvalla, SRIFIR [Group IX(1)].



Process for the preparation of ethylene from ethyl alcohol consists in passing superheated vapours of ethyl alcohol through a fluidised bed of solid activated alumina type catalyst e.g. activated bauxite at 600—750°F. wherein the height to diameter ratio of the catalyst bed is not more than 6 : 1. The catalyst bed is supported on a distributor consisting of a static bed of relatively coarse catalyst such as sand, glass beads or the like. The catalyst bed is heated by electric resisters fitted on the outside of the reactor.

Apparatus for the process consists of a catalyst chamber wherein ethyl alcohol is dehydrated to ethylene, which chamber is provided with an inlet for superheated alcohol vapour, a vapour distributor 7 for distributing the incoming alcohol vapour; this distributor 7 consists of a perforated invented hollow cone covered with a screen to provide a seat for the catalyst; and an outlet for the gaseous products formed. In carrying out the process, alcohol is pumped into the alcohol boiler 4 where it is vapourised and the vapours pass through the separator 5 where it is superheated. The superheated vapours enter the reactor 6 and the vapours are distributed by the conical distributor 7. The reaction products then go to the condensing and cooling system 10 and then into the scrubber 11.

57013. 9 April 1956 : **A method for pre-treatment of non-coking, weakly coking & semi-coking coals for conversion to coking coals**—A. Lahiri, A. N. Basu and S. N. Gupta, CFRI [Group XXXII (1)].

This invention relates to a method for pre-treatment of non-coking, weakly coking and semi-coking coals for conversion to coking coals consists in subjecting coal to dielectric heating with high frequency electric waves. The coal when subjected to dielectric heating break the reactive groups in coal (such as phenolic groups, hydroxylic groups, carboxyl groups, carboxylic groups, guinone groups and anthrone groups).

For Example

Coal samples which produced non-coking residue on carbonisation in a laboratory gray king assay apparatus, were subjected to high frequency (30 mc/sec) heating (dielectric) for time periods varying from 10 minutes to 30 minutes. The coal samples they treated were carbonised again as stated and the resultant coke examined. The resulting coke samples with 20 minutes dielectric heating were found to be stronger and more coherent than the original carbonised residue.

57267. 7 May 1956 : **Improved process for obtaining pulp from bamboo for making cheap grade printing paper**—G. M. Vyas, R. V. Bhat & K. A Chowdhury, Forest Research Institute [Group XXIV(4)].

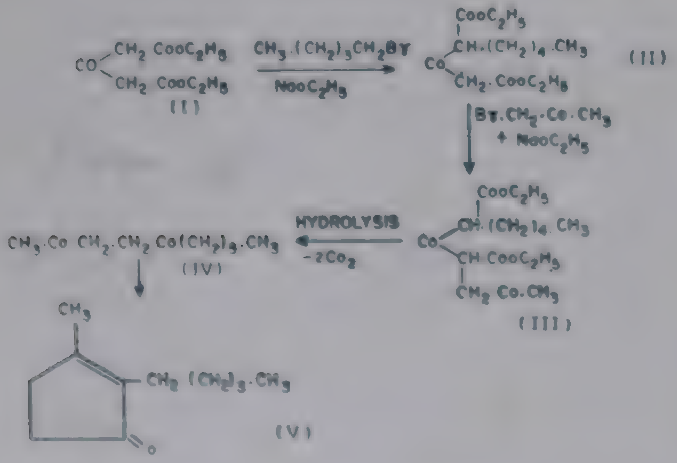
The invention relates to a process for the manufacture of pulp, paper, board or the like by treatment of bamboo. The process consists in subjecting bamboo with 30% moisture to mechanical disinteragtion to cause cleavage between parenchyma and fibre, the mechanical disintegration being continued after the cleavage has occurred until the two following fraction are obtained : (i) fibres and (ii) the "fines" fraction consisting of the parenchyma plus a part of the fibre product. The mechanical disintegration may be effected in a hammer mill wherein the screen is made of V-shaped bars arranged to have an opening of 1/8th of an inch in between and the hammer mill has breaker plates at all available area of disintegration. The separated fibres having 40 to 60 per cent of bamboo are pulped by any of the conventional pulping processes involving digestion by a cooking liquor. The separated fines may also be made into mechanical pulp by grinding in kollergang, rod mill, disc refiner, beater or the like. The fines piror to reduction may be given a pretreatment with 1 to 10% sodium hydroxide at temperature below 100°C for 1 to 4 hours. The pretreatment may also either be with 1 to 10% of sodium sulphite solution alone or buffered with sodium hydroxide, sodium carbonate, sodium bicarbonate or the like. After pretreatment the pulp may be brought to *p*H of 4 to 6 by addition of an acid e.g., H_2SO_4 or sulphurous acid. The 'fines' mechanical pulp also may be treated with bleaching agents like sodium or zinc hydrosulphite or sodium or hydrogen peroxide.

Reference is made to Indian Patent No. 49054.

57268. 7 May 1956: **A process for the preservation of sweet toddy (Neera) obtained from palmyrah trees**—P. S. Sharma, University of Madras [Group XIV(5)].

Relates to a process for the preservation of sweet toddy (neera) obtained from palm trees. It consists in adding "Paludrine" (Trade Mark for N'-p-chlorophenyl N-5 isopropyl biguanide) to Neera for its preservation. The 'Neera' used is obtained from any of the four palm varieties, namely palmyarh, sago, date and cocoanut.

57541. 7 March 1956: **A process for the preparation of dihydro jasmone**—R. K. Razdan and S. C. Bhattacharyya, NCL [Group IX(1)].


CO CH2 CooC2H5 CH2 CooC2H5
(I)
CH3.(CH2)3CH2Br
NaoC2H5
CooC2H5
Co CH.(CH2)4.CH3 CH2.CooC2H5
(II)
Br.CH2.Co.CH3 + NaoC2H5
CooC2H5
Co CH.(CH2)4.CH3 CH.CooC2H5 CH2 Co.CH3
(III)
HYDROLYSIS
-2Co2
CH3.Co CH2.CH2 Co(CH2)3.CH3
(IV)
CH3
CH2 (CH2)3.CH3
o
(V)

A process for the preparation of dihydrojasmone consists in the conversion of the condensation product 2 : 5-diketo-4 : 6-dicarbethoxy undecane by hydrolysis with aqueous alkali, through the diketone derivative 2 : 5-diketo-undecane to dihydrojasmone.

57884. 14 July 1956: **Improvements in or relating to magnesium silicate refractories and use of the same**—R. Singh, V. K. Moorthy and P. C. Sen, MLN [Group XXV(2)].

A process for the manufacture of highly spalling resistant magnesium silicate refractories (forsterite refractories) consists in improving on the spalling resistance of the refractories by incorporation TiO_2, introduced as rutilo, anatase or other like titanium mineral, into the magnesium silicate refractory composition.

57886. 16 July 1956 : **A new curing agent for wet salting of hides and skins**—S. C. Nandy, S. N. Sen and B. M. Das, CLRI [Group XXIV(3)].

A curing agent for wet salting hides and skins consists of a mixture of the following ingredients in the proportions mentioned below :—

Sodium chloride	50–75%
Ammonium sulphate	10–25%
Sodium sulphate	25–50%

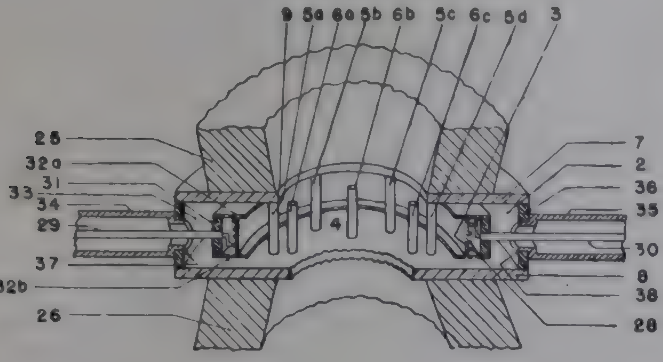
57887. 16 July 1956 : **Improvements in or relating to basic refractories and use of the same**—R. Singh, V. K. Moorthy and P. C. Sen, NML.

57888. 16 July 1956 : **Improvements in or relating to the production of hydroxy, alkoxy or aryloxy substituted aryl alkyl ketones**—J. L. Bose and R. C. Shah, NCL [Group IX(1)].

An improved process for the production of hydroxy, alkoxy or aryloxy, substituted aryl alkyl ketones of the general formula R. Co. R' where R is a hydroxy, alkoxy or aryloxy substituted aryl radical and R' is an alkyl radical consists in causing phenol or a phenol ether to react with an aliphatic acid using a mixture of phosphorus oxychloride and anhydrous zinc chloride as a condensing agent. An inert solvent like tetrachloroethane may be used as a diluent. The reaction is carried out at temperatures between 0° and 110°C. The phosphorous oxychloride is recovered by distillation under reduced pressure.

57935. 20 July 1956 : **Micro-film stand and copy-holder**—V. Cadambe and Gurbux Singh, NPL.

57936. 20 July 1956 : **Atunable magnetron**—Amarjit Singh, NPL [Group LXIII(4)].

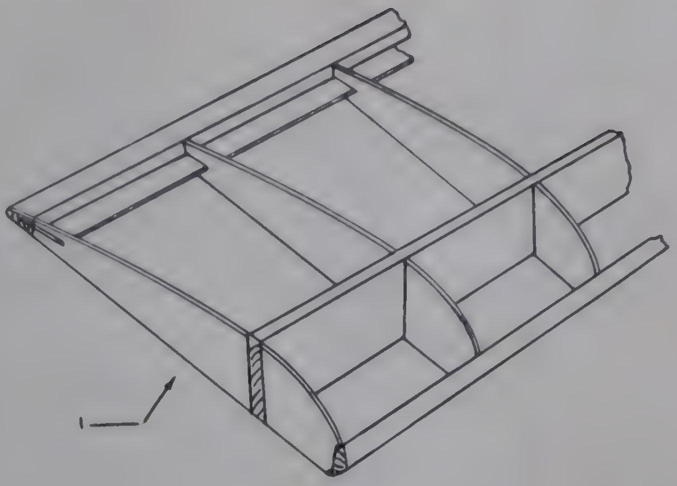


A tunable magnetron consits of an electron emitting cathode *3* which coaxially surrounds an interdigtating anode *4*, anode coupled to a tunable resonator. The anode consists of a circular array of fingers *5a*, *5b*, *6b*, etc. joined alternately to the top and bottom plates *7*, *8* of the envelope *2*. The tunable resonator is symmetrical with respect to the axis of the anode and may comprise a tunable coaxial line or alternatively a simple tunable cavity. The outer conductor *10* of the coaxial line *11* is joined to the annular face plate *7*. The inner conductor of the coaxial line consists of the cylindical members *12* and *12a* joined to each other. Member *12* is also joined to the face plate *8*. A slidable tuming plunger *17* produces a short circuit between the inner and outer conductor. The inner conductor *18* of the output coaxial line *19* projects into the cavity *20*. The outer conductor *23* is joined to the face plate *8*. Annular pole pieces *25* and *26* are coaxial with the cathode *3* and are touching the face plates *7* and *8*.

57937. 12 November 1957 : **Improvements in or relating windmill rotor blades or aerofoils used in aircraft and gliders**—P. Nilakantan [Groups XXIII, XLIV(4) and LIII(1)].

This invention relates to aerofoils and particularly to the use of bamboo matting as covering in the manufacture of aerofoils such as windmill rotor baldes, air craft wing, control surfaces (such as aileron, rubber, flap elevator).

The aerofoil consists of a frame work covered with bamboo matting (1) provided with a protective coating of resin, paint, varnish, dope or the like. The bamboo matting (1) preferably consists of plysheets woven out of thin bamboo strips of thickness 1/16″ or more and width of about ¼ inch or more. The covering of the bamboo matting (1) is fixed on the framework by first removing the protective coating of the matting at the surface of contact with framework and fixing with an adhesive under pressure. The pressure being provided by nailing, clamping or jig pressing of the bamboo matting (1) over the surface of contact with the framework.



57938. 20 July 1956 : **Aluminising of iron and steel**—M. N. Khanna and B. R. Nijhawan, NML [Group XXXIII(9)].

The invention relates to a process for the aluminising of iron and steel products which consists in subjecting them to the following treatment:

(a) cleansing and degreasing

(b) pickling

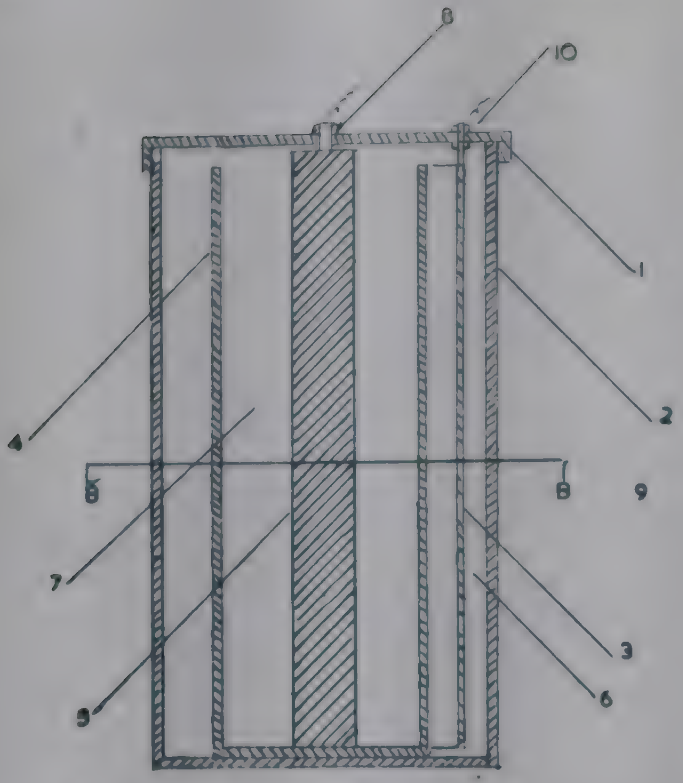
(c) application of flux (potassium fluoride)

(d) drying and preheating

(e) immersion in molten aluminium bath

The process according to the invention is characterised in that an aqueous solution of potassium fluoride is used as the flux. Concentrated hydrochloric acid is used for pickling the steel specimens for ten to twenty seconds and the acid is maintained at 60–80°C.

57958. 24 July 1956 : **A new primary wet cell**—V. Aravamuthan, CECRI [Group LVIII(1)].



A primary wet cell consists of a primary porous pot wet cell system in which ferric chloride is employed as a depolariser. The cell has a hollow, solid, perforated cylinder *5* of graphite having screw terminal 8 with lid 1 fitted to it, acting as the positive electrode. A porous pot *4* which surrounds the cathode *5* contains liquid depolariser *7* which is a solution of commercial ferric chloride. An arcshaped amalgamated zinc plate *3* dips in an electrolyte *6* of commercial sodium chloride.

58007. 30 July 1956 : **A process for the manufacture of active carbon from coals and lignites**—S. H. Zaheer, D. S. Datar, T. L. N. Rao, R. Osmani, E. R. Saxena, K. N. Moorthy, Y. Venkatesham, M. G. Krishna, G. S. Chowdhury, and K. G. Rangrez, RRL, Hyderabad [Group IV(2)].

Relates to a process for making active carbon consisting of preparing semicoke from coals and lignites by a process of low temperature carbonisation at temperature ranging between 450° and 750°C wherein the material to be carbonised is directly heated by the hot gases obtained by combustion of the gas evolved during carbonisation and by recirculating the gases of combustion and the gases evolved during carbonisation and powdering the semicoke to the particle sizes finer than 150 mesh B.S.S. The temperature of carbonisation ranges from 580° to 750°C. The process may comprise the steps of reacting semicoke with steam at 600°C or above till the loss of weight of the coke is 40—90% of its weight and then powdering it to various particle sizes from 6—300 mesh B.S.S.

58085. 7 August 1956 : **A sealing device for containers**—C. R. Gupta, NPL [Group XL (6)].

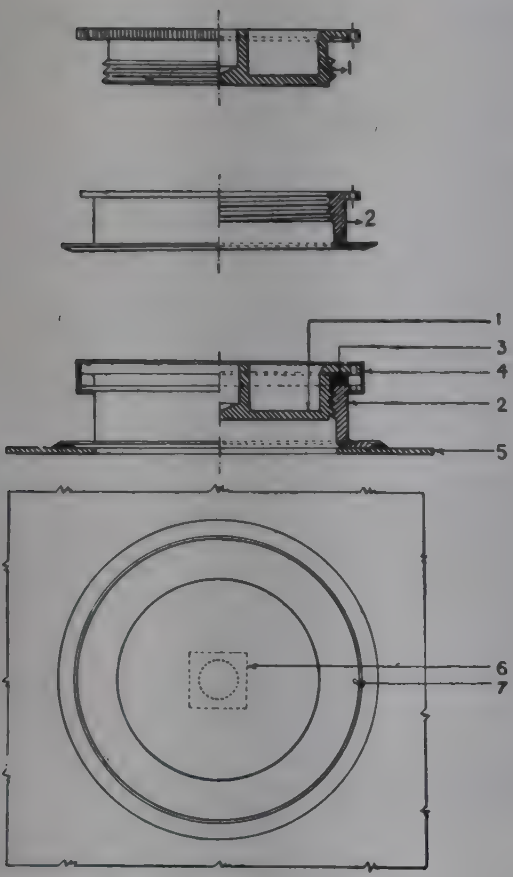
A sealing device for containers comprises a female coupling (2) with top and bottom flanges which female coupling (2) is attachable to the periphery of an opening a container, a male coupling (1) with a top flange which male coupling can be fitted into the central opening in the female coupling. A compressible ring (3) is provided which can be pressed in between the top flange of the female coupling (2) and underneath the male coupling (1) flange to give a leak proof-closure.

58203. 21 August 1956 : **Improvement in or relating to the preparation of mush acid, 2-methyltridecane 1 : 13 dicarboxylic acid**—K. K. Chakravarti and S. C. Bhattacharyya, NCL [Group IX (1)].

Ethyl ester of musk acid (2-methyl-tridecane-1 : 3-di-carboxylic acid), is prepared by dehydrating ethyl ester of 2-methyl-2-hydroxy-tridecane-1 : 3-dicarboxylic acid (betahydroxy ester) and hydrogenating dehydromusk ester (2-methyl-trideca-1-ene-1 : 3-dicarboxylic acid) thus obtained. The aforesaid beta-hydroxy ester is obtained by condensing ethyl ester of 12-keto-tridecane-1, carboxylic acid with bromoacetic ester using Reformatsky's reaction.

58243. 25 August 1956 : **A process for the separation of sodium sulphate from mixtures of sodium sulphate and sodium chloride**—R. K. Sapre and S. D. Buch, CSMCRI [Group III-39].

A process for separating sodium sulphate crystals from its mixture with sodium chloride comprises subjecting a pulp of the mixture in a brine saturated with sodium chloride and sodium sulphate to a froth flotation operation employing a reagent or reagents of the type of high molecules weight sulphated aliphatic alcolids containing eight to twelve



carbon atoms or sodium compounds of such alcolids.

The mixture of sodium sulphate and chloride is brought to a particle fineness of 36, mesh and made into a pulp with a brine saturated with sodium chloride and sodium sulphate at the temperature of flotation (10°C to 105°C) so that the weight ratio of solids to brine in such a pulp is from 10 to 40 : 100.

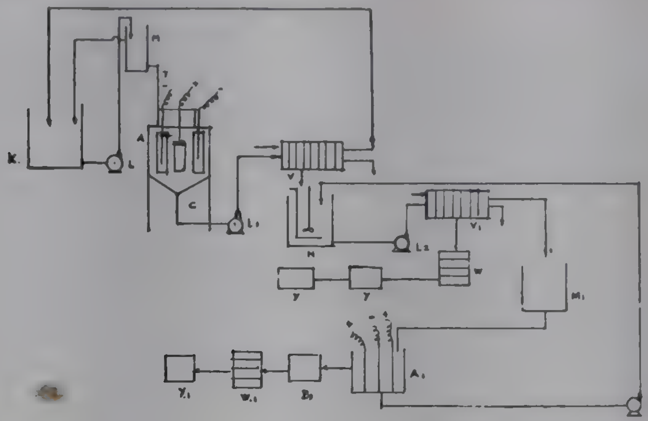
The brine employed as floation medium may be either neutral, acidic or alkaline and the temperature of such brine may vary from 10°C to 105°C and the flotation agent employed is sodium n-octyl sulphate (C_8H_{17}-O-SO_3-Na) in a quantity varying from 0·05 to 1 lb per ton of sodium sulphate in the mixture.

58244. 25 August 1956 : **An improved method for upgrading ferruginous ores, particularly separating iron from ilmenites**—P. P. Bhatnagar and T. Banerjee, NML [Group III].

Reacting ilmenite with hydrogen chloride at elevated temperature to remove the iron and chlorinating the residue *in-situ*.

58305. 3 September 1956 : **A process for the preservation of sweet toddy (Neera) obtained from palm trees**—P. S. Sharma, University of Madras.

58352. 6 September 1956 : **Electrolytic preparation of cuprous oxide**—B. B. Dey, H. V. Udupa, S. Sampath and R. Viswanathan, CECRI [Groups III and LVIII(5)].



A process for the electrolytic preparation of cuprous oxide from brass or brass scrap consists in using it as an anode in alkaline sodium chloride solution and pure cuprous oxide is obtained from the anodic oxidation product by leaching with strong alkali to remove the zinc compounds as sodium zincate.

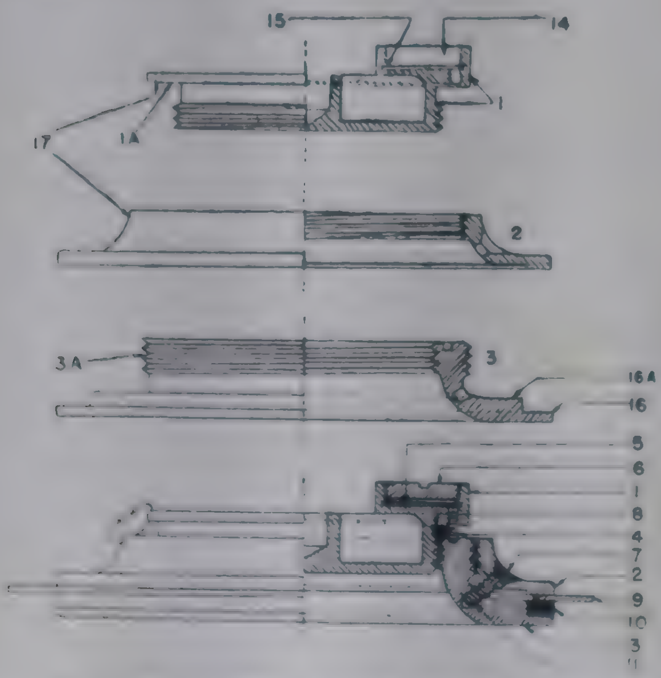
In the process, preheated (R 65°C to 95°C, but preferably 80°C) electrolyte containing not less than 10% sodium chloride by weight (preferably a saturated solution) and 0·3 to 3 gpl alkali (expressed as sodium, hydroxile) is fed into the cathode chambers of an electrolytic cell in which sheet brass or copper is used as cathodes and brass is used as anode and wherein the rate of flow of the electrolyte is such that the alkalinity of the bath is always maintained at the specified optimum range, viz, 0·3 to 3 gpl expressed as sodium hydroxide.

The brass sheets or cast plates of brass are used when the anodes are stationary; rods, hollow cylinders, strips suitably arranged on a circular frame or discs mounted on a shaft (rotating either horizontally or vertically) all of brass are used where the anode is rotated, the r.p.m. is so adjusted as to give an anode surface velocity of 10 to 60 metres/minute through electrolyte. A current density of 1·5 amperes/dm^2 is used where the anode is stationary and 5 to 100 amps/dm^2 or beyond is used when the anode is rotated with a view to shorten the duration of the process as well as to increase the cell capacity. The electrolysis is carried out at temperature of 65° to 95°C but preferably at 80°C.

58353. 6 September 1956: **Modification of a process for the electroplating of metals on aluminium or its alloys**—T. Banerjee and D. S. Tandon, NML [Group LVIII(5)].

The invention relates to a process for electroplating of metals on aluminium alloy. The process consists in providing it with a coating of iron by dipping it in an acidic solution of ferric chloride of the composition claimed in claim 7 of Indian Patent Specification No. 51524 before final plating with nickel, nickel and chromium or the like. The process is characterised in the ferric chloride at any temperature within the range of 25° to 95°C can be used.

58382. 11 September 1956: **A container closure device**—C. R. Gupta, NPL [Group XL(6)].



In a container closure device comprising a female coupling member (3) particularly suited for use as a component of the sealing device described in patent No. 58085. The female coupling member is provided with a bottom flange (16) to engage the periphery of an opening in a container body and for receiving compressible packing material (10) and external threads (3A) to engage a nut (2) for tightening the female coupling member with the container body (9

58383. 11 September 1956: **A method of isolation of sepogenins**—R. N. Chakravarti and M. N. Mitra, School of Tropical Medicine [Group XI(1)].

Relates to a method for the isolation of sapogenins. It consists in hydrolysing saponin with an aqueous acid such as hydrochloric acid without using any alcohol. The sapogenin formed is extracted in a single stage. The saponin fraction itself is obtained by defatting by heating an aqueous slurry of a saponaceous plant extract.

58384. 11 September 1956: **A process for the recovery of copper from copper pyrites**—G. C. Mitter, B. K. Bose and S. G. Dighe, Govt. of India Assay Deptt. & Silver Refinery Project [Groups III and LVIII(5)].

The invention relates to a process for recovery of copper from copper pyrites which consists in dissolving in an aqueous solution of alkali chloride, cuprous chloride obtained from the pyrites slightly acidifying and electrolysing the resultant solution, resulting in recovery of part of the copper as metal and wherein the balance of the copper is recovered from the solution as cupric chloride which is used for obtaining cuprous chloride from copper pyrites. While electrolysing the solution insoluable graphite electrode is used as anode and thin copper sheet is used as cathode and the temperature is maintained between 25°–30°C.

Reference is made to Indian Patent Specification No. 49635.

58528. 29 September 1956: **Manufacture of light basic magnesium carbonate**—Mata Prasad, B. K. Shukla and D. J. Mehta, CSMCRI [Group III].

A process for the manufacture of light basic magnesium carbonate consists in adding Sambhar lake bittern or any lake bittern having approximately the same composition as the sea bittern and stirring the mixture to precipitate basic magnesium carbonate. The precipitation of magnesium carbonate is carried out at room temperature. The precipitate is filtered washed until free from chloride and sulphate ions and dried at 105°–110°C.

58529. 29 September 1956: **An improved process for the preparation of**

B-ionone—H. J. V. Krishna and B. N. Joshi, NCL [Group IX (1)].

Process for the preparation of β-ionone by the cyclisation of pseudo-ionone under the influence of concentrated sulphuric acid and glacial acetic acid and stirring the reaction mass after cyclisation is characterised in that the temperature of the reaction mass after cyclisation is kept below 15°C till the removal of β-ionone formed.

Example

Pseudo-ionone (50 g.) is added to a mixture of concentrated sulphuric acid (175 g. 95% conc.) and glacial acetic acid (75 g.) with stirring below 10–15°C. The mixture is stirred for a further 5–10 minutes at 10–15°C and then poured into a stirred mass of broken ice and an organic solvent immiscible with water such as other or benzene. β-ionone is purified by steam distillation and finally by fractional distillation under reduced pressure yield, 37 g. b.p. 105–108°C/0·22 mm.

58552. 4 October 1956: **Improvements in or relating to thermal dehydrochlorination of ethylene dichloride**—R. K. Bhatnagar and N. R. Kuloor, SRIFIR.

58553. 4 October 1956: **Improvements in or relating to mullite refractories from kyanite**—Rabinder Singh and H. P. S. Murthy, NML [Group XXV(2)].

Relates to a process for the production of mullite refractories by the mullitisation of a mullite forming constituent is characterised in that the mullite forming constituent consists partly or wholly of uncalcined kyanite. Mullitisation is effected by subjecting uncalcined myanite or a body mix consisting of calcined and uncalcined kyanite to a forming pressure of 5,000 to 10,000 lbs. per square inch and firing the product to a temperature of 1500°C or more.

Example

Kyanite lumps as received are calcined to 1400°C in a suitable calciner, cooled and curshed to pass 7 mesh B.S.S. Another lot of raw lumps is charged into the ball mill and ground to 100 mesh B.S.S. Forty parts of calcined kyanite, thirty parts of uncalcined kyanite and 30 parts of washed plastic clay are mixed in a Simpson Mixer with enough water to give a sticky mass and allowed to age at constant humidity for at least three days. The mix is then pugged, air oried to correct the moisture content and pressed at 10,000 lbs./sq. inch to yield 9″×4½″×3″ products. These are fired to 1500°C.

58554. 4 October 1956: **Process for reducing hygroscopicity and caking of ammonium nitrate fertiliser**—Eshwar Raj Saxena, Dinkar Shripat Datar and S. H. Zaheer, RRL, Hyderabad [Group I(4)].

In a process for reducing hygroscopicity and caking of ammonium nitrate fertilizer by coating ammonium nitrate granules with a material with good covering power the coating material consists of bone powder and/or river silt. The bone powder or river silt is 2-3% of the weight of the granules. Ammonium nitrate granules may be diluted with diluents e.g. limestone dolomite clay river silt prior to coating.

58597. 8 October 1956: **A novel vehicle lamp device**—C. R. Gupta, NPL [Group XXX(4)].

This invention relates to a lamp device for use on transport vehicles. The device consists of a vehicle lamp provided with means for rotation of the light along a vertical and/or horizontal axis in desired angular relationship to the movement of the turning mechanism of the moving vehicle. The rotary means consist of (i) a rope and pulley mechanism or (ii) a flexible shaft mechanism. The rope and pulley mechanism or the flexible shaft mechanism is attached to the tie rod of the steering wheel of the vehicle by a linkage mechanism or a toothed rock and gearing mechanism.

Indian Specification Nos. 14858, 15227, 16661, have been referred to.

58660. 18 October 1956: **A new process for the production of aluminium hydroxychlorides**—A. Joga Rao and B. A. Shenoy, CECRI.

58661. 18 October 1956: **Improvements in or relating to the anodising of aluminium**—A. Joga Rao and B. A. Shenoy, CECRI.

58662. 18 October 1956: **Improvements in the technique of sensitising anodic films with blue printing solution**—A Joga Rao and B. A. Shenoy, CECRI

58663. 18 October 1956: **Production of designs in anodic films**—A. Joga Rao and B. A. Shenoy, CECRI.

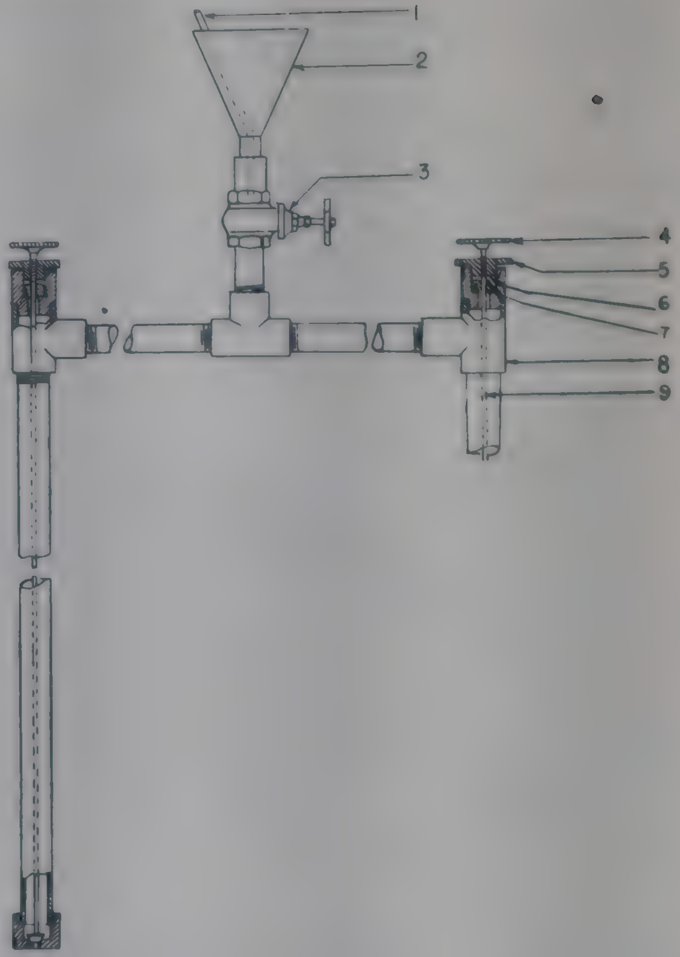
58730. 25 October 1956: **Improved process for the production of opaque anodic films suitable for photographic reproduction**—A. Joga Rao and B. A. Shenoy, CECRI

58756. 29 October 1956: **Improvements in the manufacture of maleic anhydride**—R. T. Thampy and I. K. Suri, SRIFIR [Group IX(1)].

The invention relates to a vapour phase catalytic oxidation process for the manufacture of maleic anhydride, by reacting an organic compound with four or more carbon atoms with oxygen or oxygen containing gas, in the presence of a catalyst consisting of molybdenum oxide and vanadium oxide on an inert carrier. The organic compound consists of (i) an aromatic hydrocarbon having one benzene ring or (ii) an alephatic hydrocarbon containing not less than five carbon atoms or (iii) members of the furane group or (iv) an unsaturated fatty acid containing not less than two conjugated double bonds. The process is characterised in that the catalyst is prepared by fusing alundum at red heat, treating the fused alundum with hydrochloric acid and impregnating the carrier thus obtained with an aqueous solution of vanadium and molybdenum salts; the reaction of the organic compound gas in presence of the catalyst thus obtained is carried out in a fluidized bed. The proportion of vanadium oxide to molybdenum oxide in the catalyst is 1 : 0·8 to 1 : 1·5. The carrier consists of alundum and/or quartz. The catalyst is dried initially at 100—150°C for 20 hours and then activated at 300—500°C for another 24 hours in an atmosphere of oxygen or oxygen enriched air.

58757. 29 October 1956: **An improved syphon**—C. R. Gupta, NPL [Group XXVIII(2)].

This invention relates to a syphon which consists of a syphoning pipe *10* with two unequal arms, a regulating valve *10* on each side of the syphoning pipe to regulate the suction and delivery of liquids. The syphone is characterized in that an isolating valve *3* with a funnel *2* is provided in between the two arms to (i) facilitate the pouring of priming liquid when such liquid is available for pouring through the funnel, (ii) to facilitate air escape during priming and (iii) to cut off atmospheric pressure from the syphoning system when the priming liquid has reached above the level of the isolating valve. An air vent pipe *1* may be provided within the funnel to facilitate the escape of air during priming. The valve provided a valve of the disc type, flap valves or the like. Where liquids handled are not suitable or available for priming, a detachable pump *12* may be provided for sucking liquids from the contained for priming the syphon. The regulating valve of the shorter arm is a suction valve and that of the longer arm is a delivery valve. The total area of the delivery valve through which the liquid flow out is less than the area of the suction valve to allow for head lost in suction, bends, friction and discharge mouth. The suction pump is attached to the bottom



of the suction valve for sucking liquid into the syphon arm.

58868. 13 November 1956 : **A process for the preparation of azelaic acid semiester suitable for making civetone dicarboxylic acid**—U. G. Nayak, K. K. Chakravarti and S. C. Bhattacharyya, NCL [Group IX(1)].

Ester of dihydroxy stearic acid is oxidised to the semialdehyde ester which is further oxidised to azelaic acid semiester.

58869. 13 November 1956 : **Refractory compositions comprising graphite and silicon carbide**—T. V. Prasad, H. P. Srinivasamurthy and Rabindar Singh, NML [Group XXV(2)].

Self glazing carbon bonded graphite silicon carbide bodies suitable for use in metallurgical industries particularly as containers for melting metals are composed of graphite, silicon carbide, a carbonaceous binder, an aluminosilicate grog and a metal (or alloy) powder. The graphite used bias not less than 80% carbon content and not more than 13% ash content and the mixture contains upto 60% of the graphite and upto 55% of silicon carbide. The carbonaceous material used is hard pitch or soft pitch. In making the composition the mixes are mixed hot and are fired at about 1100°C and then flashed at 1350°C in an oxidising atmosphere.

58870. 13 November 1956 : **A process for the isolation of the cardioactive glycosides of digitalis**—M. M. Dhar, N. M. Khanna and M. L. Dhar, CDRI [Group IX(1)].

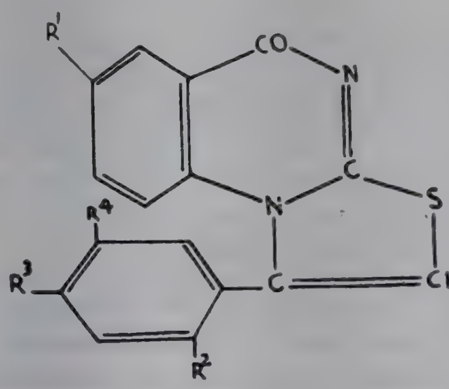
A process for the preparation of the cardioactive glycosides of Digitalis species consists in the treatment of the Digitalis leaves, fresh or dry or the extractives obtained therefrom with new tarmate splitting agents (for fissioning the Digitalis glycosides tarmates) consisting of an oxide, hydroxide, carbonate or salt of barium, copper, manganese, zinc or an ion exchange resin.

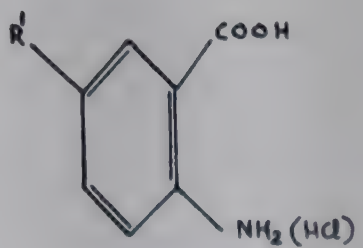
Example

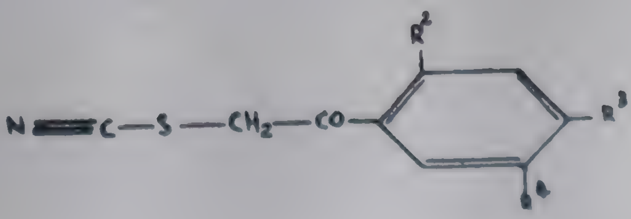
1000 gm of the powdered well preserved Digitalis Lanate leaves were percolated with ethanol. The combined percolates were evaporated to a small volume and extracted with benzene to remove the colouring matter (chlorophyll etc.). The glycosides tannates were then extracted with chloroform, chloroform removed and the residue taken up in alcohol and treated with barium carbonate. The solid was removed by filtration and washed with alcohol and the alcoholic solution evaporated to dryness. The resulting product consisted of the desired Digitalis glycosides.

Reference has been made to Specification No. 62497.

58902. 16 November 1956 : **A process for the preparation of 9 : 10 thiopegan derivatives containing phenolic hydroxy groups**—K. Narang, H. S. Sachdev and K. S. Dhami, Panjab University [Group IX (1)].





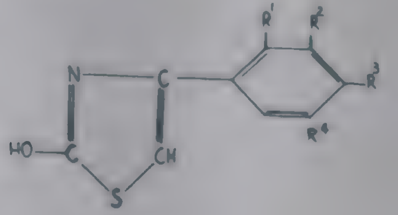


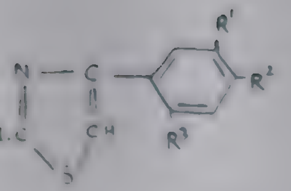
The process of manufacture of 9 : 10 thiopegan derivatives containing phenolic hydroxy groups useful as chemotherapeutic agents and having the general formula shown in fig. 1 of the accompanying drawings, wherein R^1 is hydrogen or hydro carbon or alkoxy radical, R^2, R^3 and R^4 are hydroxy or hydrogen or alkyl radicals but not more than one is hydroxy of alkyl radical, comprises the interaction of an anthramilic acid hydrochloride of the formula shown in fig. 2 of the accompanying drawings, wherein R^1 is hydrogen or hydrocarbon or alkoxy radical with an thiocyanoketone of the formula shown in fig. 3 of the accompanying drawing, wherein R^2, R^3 and R^4 are hydroxy or hydrogen or alkyl radicals but not more than one is hydroxy or alkyl radical.

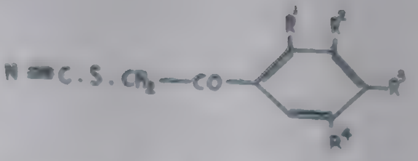
Example

2·4 parts of w-thiocyano-3-methyl-6-hydroxy acetophenone and 2 parts of anthramilic acid hydrochloride and 40 parts of ethanol are refluxed for 8 hours. After cooling 3—(3′-methy-6′-hydroxy) phenyl-9 : 10-thiopega-2 : 10-diene-4-one m.p. 311°C is obtained (all parts are by weight).

58903. 16 November 1956 : **Preparation of 2-hydroxy and 2-chlorothiazoles containing phenolic residues in position 4**—K. S. Narang, H. S. Sachdev and K. S. Dhami, Panjab University [Group IX(1)].







This invention relates to a process for the manufacture of 2-hydroxy thiazoles containing phenolic residues in position 4 which are potential chemotherapeutic agents.

It provides a process for the manufacture of 2-hydroxy thiazoles of the general formula shown in fig. I wherein R^1, R^2, R^3 and R^4 are hydrogen, hydroxy or hydrocarbon radicals by reacting thiocyanoketone of the general formula shown in fig. III, with dilute mineral acid or preferably sulphuric acid, acetic acid and water mixture at water bath temperature.

A general procedure to illustrate the invention may be described as follows :—

2 parts of thiocyanoketone are dissolved in 8–10 parts of glacial acetic acid and 1 part of water and ·5–1 part of concentrated sulphuric acid. The solution is heated on water baths for 1 hour. After dilution with water the product is collected and crystallised from dilute methanol or ethanol.

The following are the new hydroxy thiazoles prepared in the above manner.

Example 1

2-hydroxy-4 (3'-methyl-6'-hydroxy) phenyl thiazole m.p. 223°C.

Example 2

2-hydroxy-4 (4'-methyl-6'-hydroxy) phenyl thiazole, m.p. 213°C.

Example 3

2-Hydroxy-4 (2' : 3' : 4'-di-hydroxy) phenyl thiazole m.p. 257°C.

Example 4

2-Hydroxy-4 (2' : 3' : 4'-di-hydroxy) phenyl thiazole, m.p. 230°C.

Reference is made to Indian Specification No. 58902.

58909. 17 November 1956 : **New foaming agents for production of low density foamed concrete**—G. W. Kapse and S. K. Chopra, CBRI [Group XXV (2)].

A process for the preparation of a foaming agent for the production of foamed concrete consists in emulsifying a resin soap in an aqueous solution of animal glue. As raw materials, a pale grade of rosin rich in pimaric acid content and animal glue of "STIKONIAS" (trade name) grade or similar grade may be used. A 3 to 4 percent solution of the foaming agent is prepared for making foamed concrete. The foaming agent thus prepared has an adequate (6–8 months) shelf life.

59011. 29 November 1956: **An improved process for the production of enzyme depilants and bates for leather manufacture**—S. Bose, S. C. Dhar and (Late) B. M. Das, CLRI.

59088. 7 December 1956: **Production of delta-3-carene polymers**—L. M. Yeddanapalli and R. Santhanam, University of Madras [Group IX(1)].

The invention relates to preparation of polymers, dimers and tetramer, of delta 3-carene isolated from the Indian turpentine oil pinus longifolia.

The process consists in heating a solution of delta 3-carene in an organic solvent such as toluene, benzene or the like with an acid type catalyst such as anhydrous aluminium chloride, boron trifluoride, or similar halide catalyst.

The heating may be in temperature range of 30°–80°C and continued for about 4 hours with continuous stirring, and resulting products washed with dilute mineral acid followed by washing with water and removing the solvent to obtain a mixture of polymers.

There may be used a monomer of concentration of 10–60% by weight while catalyst may be of concentration of 5–10% by weight. The mixture of polymers may be separated into dimer and tetramer by fractionation with an ordinary fractionating column packed with glass tubes under vacuum.

59250. 29 December 1956: **Electrowinning of lead from lead sulphate**—B. B. Dey, V. Aravamuthan and P. R. Rajagopalan, CECRI [Group LVIII(5)].

A process for the electrowinning of lead from lead sulphate such as from battery water, battery dust, galene concentrates on the like consists in conducting electrolysis between 85° and 90°C using leach-liquor obtained by leaching pure lead sulphate with 20% caustic soda, containing up to 45 grams per litre of Pb as electrolyte. Stainless steel is used as cathode and plates of Acheson graphite, well wrapped in blue asbestos rope are used as anodes.

59265. 2 January 1957: **An improved method for the isolation of psoralen-isopsoralen from dried fruits of psoralea corylifolia**—S. Bhattacharji and M. L. Dhar, CDRI [Group XIX(1)].

The invention relates to a process for the isolation of psoralen-isopsoralen mixture from dried fruits (commonly known as seeds) of psoralen corylifolia (Babchi), which consists in (1) preliminary extraction of the seeds with a solvent for the removal of resinous material from the seed coat and (2) continuous extraction of the powdered, pre-extracted seeds in a soxhlet apparatus with petroleum fractions within the range 40°–120°C, followed by separation of psoralen-isopsoralen which crystallises out on keeping the petroleum extract. The process is characterised in that the preliminary extraction is carried out with petroleum ether at room temperature, i.e. 28°–35°C, to remove resinous material without dissolving any psoralen-isopsoralen. Petroleum ether (62°–82°C) may be used for extraction.

Indian Patent No. 26281 is referred to.

59266. 2 January 1957: **A method for the isolation of psoralen-isopsoralen mixture from the seeds of psoralea corylifolia (babchi)**—S. Bhattacharji and M. L. Dhar, CDRI [Group XIX(1)].

A process for the isolation of psoralen-isopsoralen mixture from the seeds of psoralea corylifolia (babchi) by continuous extraction with petroleum ether extraction is characterised in that to prior to extracting the psoralen-isopsoralen mixture, the seeds (powdered or whole) are moistened with water for a few 1–3 days and dried. The seeds used may be fresh or dried. The powdered fresh seeds are first defatted with water-immiscible solvents like petroleum ether, ether, benzene and the like before moistening with water or a dilute aqueous solution of a mineral acid like hydrochloride acid, or sulphuric acid or of a sugar splitting enzymes is used instead of water for moistening the seed powder.

Indian Patent Specification Nos. 26281 and 59265 are referred to.

59295. 5 January 1957: **A process for the production of alkali salts like alkali nimbidinates having medicinal properties from bitter constituents of nim**

C. Mitra, NCL [Groups IX (1) and XIX (1)].

A process for the production of alkali salts like alkali-nimbidinates having diuretic properties from bitter constituents of nim, comprises hydrolysis of the said constituents with alkali and is characterised in that the hydrolysis is carried out with carbonate, bicarbonate or hydroxide of sodium or potassium in ethanolic or methanolic or aqueous alcoholic solutions at a temperature ranging from 15° to 60°C for a period of 1 hour to 15 days. Bitter constituents of nim are subjected to mild stepwise alkaline hydrolysis with carbonate or bicarbonates of alkali metals in ethanolic or methanolic solution at temperatures, O° to 50°C and the acidic constituent from the alkaline hydrolysate solution is liberated by addition of cation exchange resins, the resultant nimbidinic acid (from nimbidin) is neutralised with sodium or potassium bicarbonate in aqueous-alcoholic solution and the solvent so removed in vacuo when sodium or potassium nimbidinate is obtained.

Indian Specification Nos. 33649, 33650 and 33651 have been referred to.

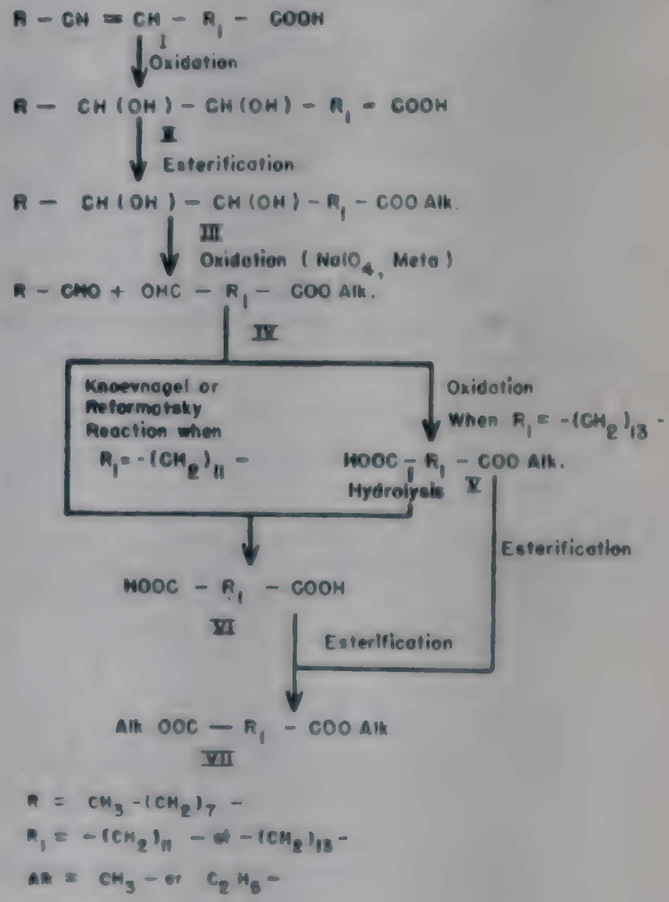
59418. 19 January 1957: **Isolation of keto-steroids from Lantana camara Linn**—V. N. Sharma, and K. N. Kaul, NBG [Group IX(1)].

A process for isolating a ketosteroid, Lancamarone, from Lantana camara Linn, consists in extracting the plant with one or more organic solvents, concentrating the extracts to obtain a solid deposit therefrom, filtering and washing the deposit repeatedly and thereafter purifying it by fractional crystallisation. Suitable organic solvents are ethanol, methanol, acetone, dioxane, petrol ether, benzene, ether, chloroform and carbon tetrachloride.

Example

500 g. of the leaf powder was extracted with chloroform (1000 c.c.) in a soxhlet apparatus and the concentrated extract (50 c.c.) was diluted with petroleum ether (50 c.c.). The precipitated impurities were removed and the clear liquor concentrated to 50 c.c. and kept, when greenish yellow deposit (5·6 g.) was obtained. On repeated fractional crystallisation from acetone and acetone-chloroform (4 : 1) mixture, lancamarone, m.p. 280°C (decomp.), was obtained.

59419. 19 January 1957: **A process for the preparation of tridecane-1 : 13-dicarboxylic acid or its ester, suitable for the preparation of exaltone (cyclopentadecanone)**—B. B. Ghatgey, U. G. Nayak, K. K. Chakravarti and S. C. Bhattacharyya, NCL [Group IX(1)].


R – CH = CH – R₁ – COOH
I
Oxidation
R – CH (OH) – CH (OH) – R₁ – COOH
II
Esterification
R – CH (OH) – CH (OH) – R₁ – COO Alk.
III
Oxidation (NaIO₄, Meta)
R – CHO + OHC – R₁ – COO Alk.
IV
Knoevnagel or Reformatsky Reaction when R₁ = -(CH₂)₁₁ -
Oxidation When R₁ = -(CH₂)₁₃ -
HOOC – R₁ – COO Alk.
Hydrolysis
V
Esterification
HOOC – R₁ – COOH
VI
Esterification
Alk OOC — R₁ – COO Alk
VII
R = CH₃ -(CH₂)₇ -
R₁ = -(CH₂)₁₁ – or -(CH₂)₁₃ -
Alk = CH₃ – or C₂ H₅ -

A process for the preparation of tridecane-1 : 13-dicar-boxylic acid (VI, R$_1$= —(CH$_2$) 13—, or its ester (VII, R$_1$= —(CH$_2$)13—, AIK-Aloxyl group, CH$_8$— or C$_2$H$_5$, Suitable for the preparation of exaltone, consists of the following steps: (I) oxidation of ester (III) of dihydroxy fatty acid (II) of the general formula R-CHOH-CHOH-R$_1$= CHOH where R=CH$_8$-(CH$_2$)$_7$—, R$_1$= —(CH$_2$) 11-or-(CH$_2$) 13—AlK ALkyl group, CH$_8$-or C$_2$H$_5$ to semialdehyde ester (VI) of the general formula OHC-R$_1$-COO Alk where R$_1$= —(CH$_2$) 11-or-(CH$_2$) 13—and Alk= Alkyl group, CH$_3$-or C$_2$ H$_5$— and (ii) subjecting (IV) to oxidation followed by hydrolysis and/or esterification, and subjecting semialdehyde ester (IV, R$_1$ = —(CH3) 11-ALK-

Alkyl, CH_3—or C_2H_5 to Knoevnagel Reaction or Reformatskey Reaction to lengthen the chain from —(CH_2) 11—to—(CH_2) 13—; the reaction involved in the process are carried out with known reagents.

The steps of the process are shown in fig. 1 of the drawings.

59455. 24 January 1957: **A process for the preparation of a protein hydrobysate for oral use**—C. R. Krishna Murti and V. Verma, CDRI [Groups IX (i) and XIX(i)].

This invention relates to a process for the preparation of protein hydrolysates for oral use. It consists in subjecting proteins isolated from defatted mustard and sesame cakes to the action of papain at a temperature of 65—70°C for 6—8 hours to obtain a clear light coloured hydrolysate. The clear light coloured hydrolysate is concentrated under vacuum and dried to a granular form in vacuo at temperatures not exceeding 45°C. The protein is isolated by peptization of the defatted oil cake.

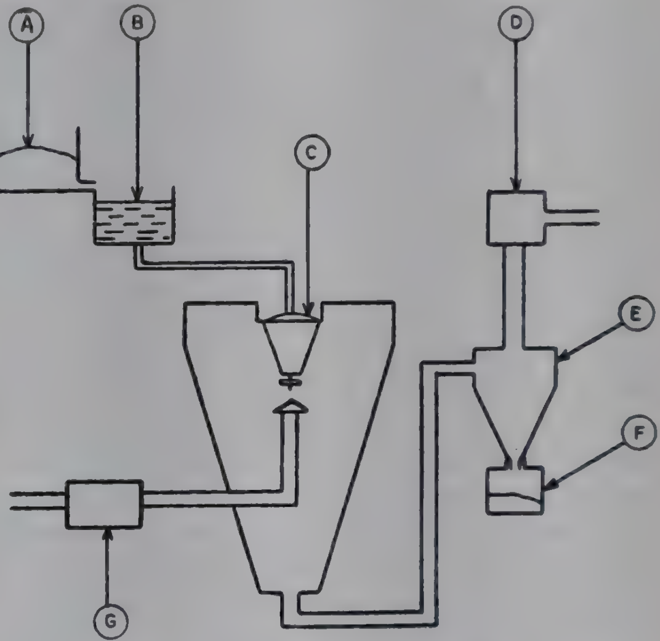
59456. 24 January 1957: **Improvements in or relating to the manufacture of hot face insulting bricks and blocks**—Atma Ram, J. C. Banerjee and P. K. Roy, CGCRI [Group XXV(1)].

This invention relates to improvements in the manufacture of hot face insulating bricks and blocks and has particular reference to the utilisation of mineral cyanite in the manufacture of insulating bricks and blocks. The process consists in mixing with water, ground and sieved cyanite with combustible matter and a binder such as plastic clay, bentonite or organic matter like starch, molasses, or the like either alone or in combination and pressing or casting into bricks and blocks in moulds and firing them at 1350=1520°C.

Example

Hot face insulating bricks could be made out with about 70% porosity and 300 lbs/59 inch crushing strength from a mixture containing 50 per cent cyanite of —60 mesh, 13—15% plastic clay of —60 mesh and 35 per cent saw dust of —20+60 mesh screen. The mixture is to be thoroughly mixed in an ordinary mixer with about 12—15% water on the total weight of the solid and then pressed into bricks in moulds. After drying they are to be fired to 1450°C for 10 to 12 hours or at 1520°C for 5 hours.

59457. 24 January 1957: **A new process for preparation of fine dusts or wettable powders of insecticides such as DDT**—(Miss) S. B. Kulkarni, P. S. Kolhatkar, A. B. Biswas, K. V. N. Rao and M. V. Kuber, NCL [Group XIX(1)].



A process for preparing fine dusts or wettable insecticidal powders of insecticides comprises atomizing a molten mass of the insecticide e.g. D.D.T., B.H.C., Aldrin, Dieldrin, Endrin or their mixtures. The molten mass is spray-atomized in the form of a mist of fine droplets by directing a get of molten mass of the insecticide against a high speed disc-type of rotor through a fine atomizer nozzle divide inside a chamber. A blast of warm air at about 50—70° is fed inside the chamber to increase the rate of crystallisation of the insecticide droplets. A nucleating agent e.g. paraffin wax, carnupa wax, sugar cane wax or steoric acid may be utilised for the rapid crystallisation of the fine droplets.

Example

D.D.T. (80—90 parts), a nucleating agent e.g. stearic acid, paraffin wax, carnauba wax or sugar cane wax (5—10 parts), and a wetting agent (5—10 parts) are melted together into a homogeneous liquid mass. The molten mass is atomized through a high speed spinning disc or a jet type atomizer. The particle sizes of D.D.T. in the final product are in the range of 10–90μ. The particles are mostly acicular in shape.

59497. 29 January 1957: **Production of porous polymer suitable for preparing cation-exchange resins**—K. P. Govindan, R. N. Pandya and N. R. Krishnaswamy, NCL [Group IX(1)].

A process for the production of a porous insoluble polymer particularly suited for preparing cation-exchange resins from cashew nut shell liquid which consists in heating the said liquid in a reaction vessel with an acid such as hydrochloric acid and formalin or formaldehyde producing substances to gel the cashewnut shell liquid and further heating or curing the gel thus obtained to obtain an insoluble porous hard polymer and wherein heating is continued and the gel that is formed is retained in the reaction vessel without separation of the products of reaction. Commercial hydrochloric acid is used. The reactants are heated up to 120–140°C with constant stirring till the porous gel starts to set. The porous gel as formed is removed from the reaction vessel and cured at 100°–140°C for 18–24 hrs. to obtain as insoluble hard porous polymer. The acid and formalin are added as a mixture to the heated cashewnut shell liquid or heated separately with cashewnut shell liquid, and then the contents gelled under heating. The reactants are heated in a vessel having sufficient room for the gel to swell and set.

59606. 11 February 1957: **Preparation of cation exchange resin from porous cashewnut shell liquid polymer**—N. R. Krishnaswamy, R. N. Pandya and K. P. Govindan, NCL [Group IX(1)].

Process for the manufacture of cation exchange resins which are water insoluble and have a relatively high capacity for the exchange of resins consists in adding to the cashewnut shell liquid a resinifying or gelling agent such as sulphuric acid or formaldehyde heating the gel thus obtained to 20°C–165°C for 18–26 hours and then treating it with a strong sulphonating agent like sulphuric acid, chlorosulphuric acid, or oleum. The medium for carrying out the sulphonation may be a highly halogenated solvent such as carbon tetrachloride, ethyline dichloride or pentachloroethane. A sulphonation catalyst such as lead, mercuric manganese or silver salt may also be used. Thus obtained cation exchange resins may be regenerated after use with brine or dilute acids.

Reference is made to Indian Patent No. 43827.

59607. 11 February 1957: **Manufacture of basic aluminium chloride**—R. Selvarangam & (late) B. M. Das, CLRI.

59608. 11 February 1957: **Rigid filters**—S. L. Kapur and R. N. Pandya, NCL [Group (VI)].

A process for the preparation of porous rigid filters of any desired shape and uniform porosity or a gradation of porosity with low flow resistance, consisting in cementing the particles to an inert material, placing in a suitable mold with or without reinforcing supports and heating if necessary, is characterised in that the cementing of the particles is done by coating them with a resinous adhesive composition of organic origin. The inert material may consist of silica, quartz, gravel, shingle, sand, glass, rock metal or plastic and the resinous adhesive composition may be prepared by condensing a phenolic material or a poly functional amine with formaldehyde or other aldehydes in molar ratio minimum 1 : 0·5 and maximum 1 : 3.

59630. 13 February 1957: **An improved process of making bricks from sticky clays**—N. C. Majumdar and N. K. Patwardhan, CBRI [Group XXV(1)].

A process of making bricks from highly plastic clays containing 40 to 50 percent of the clay minerals of the montruosillonite group, consists in thoroughly mixing such clays with 15 to 30 percent of calcined clay prior to moulding, drying and firing. The clay is preferably calcined upto a stage when the amount of chemically combined water is reduced to 4 to 5 percent and the mass is rendered non-plastic. The calcined clay is prepared by firing raw clay to 600°C and purverized to about B.S.S. 8 size.

59658. 16 February 1957: **An electric heater**—C. R. Gupta, NPL [Group LIX(2)].

An electric heater consists of secondary reflector/s in one row opposite to primary reflector/s in the other row to reflect towards

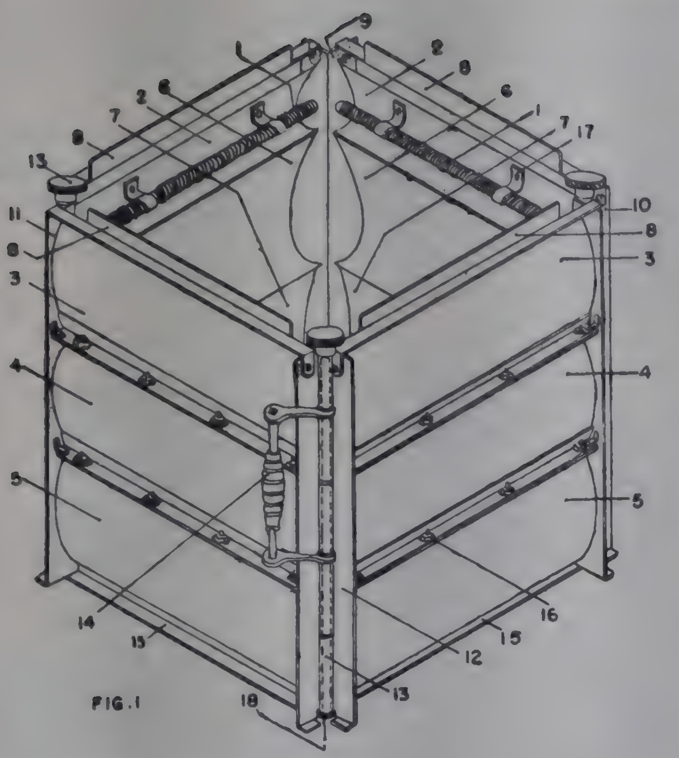


FIG. 1

a focus the heat rays which escape concentration by the primary reflector/s, in front of which heating element/s (1) is/are mounted.

One or more electric heating elements (1) sound on a porcelain tube or the like is attached to the reflector (2 or reflectors) by means of clamp (17). The reflector or set of reflectors (3, 4, 5, 6 and 7) are arranged to form a box, so that all the heat waves are reflected and re-reflected and for maximum concentration of heat waves over a specified area (22), for uniform heating. Reflectors (2, 6 and 7) are attached to each other with angle (9) to form two sides of a heater permanently fixed at right angles to each other, to which the elements (1) are attached by means of nuts and bolts 16. A set of reflectors (3, 4 and 5) are attached to each other to form the other sides of the heater box. These two sides built of reflectors (3, 4 and 5) are attached to the other sides built of reflectors (2, 6 and 7) by means of hinges (13) and hinge rod and nuts (10, 11 and 12).

59712. 22 February 1957 : **Electrolytic separation of pure lead from high antimony lead alloys**—B. B. Dey and P. R. Rajagopalan, CECRI [Group LVIII(5)].

A process for the electrolytic separation of pure lead from high-antimony lead alloys by electrolysis wherein a mixture of lead fluoborate, fluoboric acid and boric acid contained in a concrete cell lined with bitumen is employed as electrolyte and wherein high antimony lead alloy is used as the anode from which lead preferably dissolves during electrolysis and deposits at the cathode as pure lead, the antimony being left at the anode as anode mud. The anode consists of impure lead-antimony alloy containing upto 10% of antimony and other impurities.

Indian Patent Application No. 59978 has been referred to.

59713. 22 February 1957 : **Production of pure manganese sulphate and high grade iron oxide from low grade manganese ores**—T. R. Venkatasubramanian and V. Aravamuthan, CECRI [Group III].

Reacting manganese ore with waste pickle liquor to produce mixed sulphates of ferric and manganese and subjecting the mixed sulphates to thermal decomposition to obtain ferric oxide and manganese sulphate.

59794. 5 March 1957 : **A new process for the preparation of 4-hydroxycoumarin and its derivatives**—V. R. Shah, J. L. Bose and R. C. Shah, NCL.

59835. 7 March 1957 : **An improved process for the production of shrink and crease proof finishes of cellulose textiles**—N. B. Sathur, E. Syamalarao and V. B. Chipalkatti, NCL [Groups XXII(2) and XXIII].

Process for production of shrink and crease proof finishes on cellulose textiles consisting in impregnating cellulose textiles with an aqueous solution of a condensation product followed by drying at below 60°C and baking at 80°–150°C the same. The condensation product is obtained by condensing a carbohydrate derivative of urea with an aldehyde and further condensing the reaction product with a monoaldehyde like formaldehyde. The glucoseureide may be condensed with a dialdehyde as glyoxal in molecular ratio of 2 : 1 respectively. The reaction product of these condensation reactions may also be further condensed with a polyhydric alcohol like ethylene glycol or glycerine. The aqueous solution of this condensation product for treatment of the cellulose textile may contain an acid catalyst and have a *p*H of 1 to 4.

59853. 9 March 1957: **Improvements in or relating to the preparation of costus root oil and the isolation of lactonic constituents therefrom**—G. R. Kelkar and S. C. Bhattacharyya, NCL [Groups IX (1) and XI(1)].

A process for the preparation of costus root oil and the lactonic constituents thereof comprises in extracting powdered costus roots with petroleum ether (boiling range 40—60°) at 20 to 35°C. After extraction, the petroleum ether extract is separated from the plant pulp by filtration and the solvent is removed under vacuum at a bath temperature of about 40°C. The lactone called "costanohide" is separated from the costus root oil by keeping the oil at room temperature or in a refrigerator, either as such or in the presence at a small quantity of petroleum ether.

59927. 19 March 1957: **A process for the preparation of pentadecane—1: 15-dicarboxylic acid or its ester suitable for the preparation of dihydrocivetone**—U. G. Nayak, K. K. Chakravarti and S. C. Bhattacharyya, NCL [Group IX(1).]

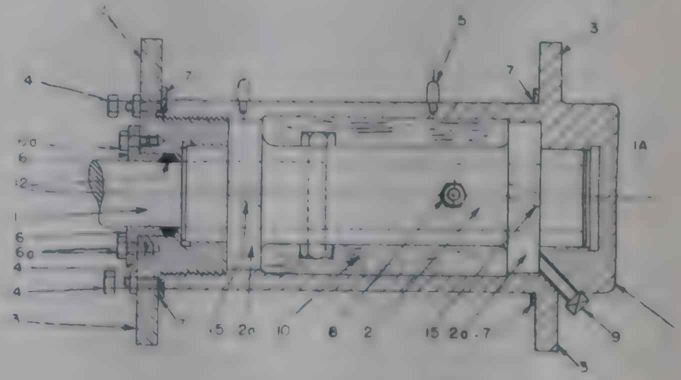
Condensing an ester of omega hydroxy or acetoxy stearic acid with a Grignard reagent and oxidising the alcohol formed and esterifying the product.

59969. 21 March 1957: **An improved container for bulk packaging**—N. V. R. Iyengar, W. B. Date, H. B. N. Murthy and V. Subrahmanyan, CFTRI.

59978. 22 March 1957: **Electro-winning of antimony**—B. B. Dey, V. Aravamuthan and P. R. Rajagopalan, CECRI [Group LVIII(5)].

This invention relates to a process for the electro-winning of pure antimony metal. The process consists in reacting (i) the anode mud from the electrolytic separation of lead from high antimony lead alloys like battery lead or (ii) battery dust and battery wastes obtained from discarded lead-acid batteries and during the process of manufacture of lead acid batteries, with concentrated sulphuric acid to obtain a mixture of lead-sulphate and basic antimony sulphate. The mixture is leached with spent electrolyte containing hydrofluoric acid and sulphuric acid to obtain the antimony in solution. The solution is electrolysed to get pure antimony metal.

60120. 5 April 1957: **Improvements in or relating to shaft and bearing mechanisms**—C. R. Gupta, NPL [Group LIV(1)].



In a shaft and bearing mechanism the shaft or axle *11* rotatable in bearings is provided with a collared bush 2; the bush is pinned to the shaft by bolts 8. The bush *2* is housed in a hub or housing *1* which is provided with flange *3* the left hand one fixed to the housing being provided with a gland mechanism *6* which forms a bearing but does not allow oil to leak and prevents dirt and dust from entering the housing. An oil pocket *10* is formed between the bush *2* and the housing; oil is fed to or taken out of the pocket *10* through a hole *9*. The oil from the pocket *10* is circulated through openings *15* in the bush *2*.

The mechanism is shown mounted in a bullock cart wheel *26* in fig. II; the axle *11* is fixed and the housing *1* is rotatable. The wheel rim (not shown) is secured to the housing *1* by means of spokes *21* spigots *5* on the housing prevent the wheel *26* from rotating relative to the housing; the two flanges *3* limit the side movements of the hub of the wheel with respect to the housing *1*.

The mechanism may be employed in a plummer block as shown in fig. VII; the housing consisting of two parts *1* and *1a* bolted together is stationary and the shaft *11* is rotatable. The liner *28* is also made in two halves and prevented from rotating relative to the housing. Oil is supplied to the oil pocket *10* through a cup *9a*.

60210. 16 April 1957: **A process for the treatment of rice bran for the preparation of a tocopherol rich oil, a**

vitamin B complex concentrate & inositol for medical use—C. R. Krishna Murti and L. V. Khanna, CDRI [Group IX(1)].

A process for the preparation of tocopherol rich oil (and also simultaneously preparing a complex concentrate and phytin) from rice bran consists in first extracting the lipids by alcohol followed by partitioning with petrol.

Example

Rice bran is taken in a round bottomed flask (wide mouth short necked) and mixed with rectified spirit. A bulb type condenser is connected and the flask placed in a water bath maintained at 90—95°C for 6 hours. The slurry after cooling is filtered through Whatmann No. 1 filter paper under suction. The clear alcoholic extract is kept in cold over night and filtered free of any precipitate that separates out. The extracts from three or four such batches are combined and distilled under vacuo so that the volume is reduced to about 1/10 the original volume and taken up in a large sized separating funnel. Equal amount of petrol ether (45—60°C) are added followed by equal amount of water shaken thoroughly and left to separate over night in the cold. The clear lower phase containing the aqueous phase is drawn out and stored for further processing to prepare a B complex concentrated. The petrol ether layer is distilled under reduced pressure to yield a brown oil.

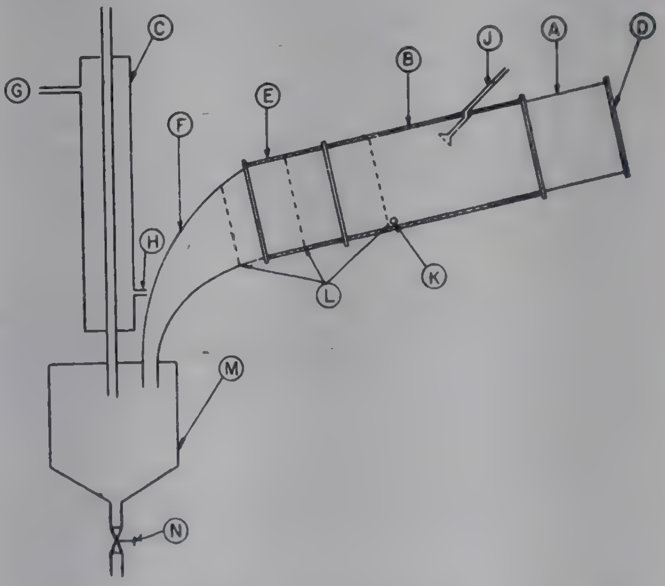
60333. 24 April 1957 : **Improvements in or relating to the production of battery grade manganese dioxide from manganese ores**—V. Aravamuthan and T. R. Venkatasubramanian, CECRI [Groups III and LVIII(5)].

A process for the electrodeposition of manganese dioxide particularly for the production of battery grade manganese dioxide from manganese ores consists in electrolysing manganese sulphate solution (obtained from manganese ore) in water and wherein not less than 5 c.c. of nitric acid of 1·42 sp. gr. or its equivalent in any other concentration of nitric acid is added per litre of manganese sulphate solution in water. The manganese sulphate suited for electrolysis is obtained from the manganese ores by any standard procedure such as roast reduction followed by leaching with cell effluent containing dilute acid and manganese sulphate, and purification or by treatment with waste pickle liquor of the iron and steel industry such as the mixture of ferrous sulphate and dilute sulphuric acid or by employing reducing agents such as carbon, saw dust, sulphur dioxide, iron or the like, in sulphuric acid medium. The electrolysis is carried out in a cell of which both anode and cathode are of graphite.

Indian specification No. 59713 has been referred to.

60334. 27 April 1957 : **A new method for the preparation of 4-hydroxy coumarin**—D. R. Shah, J. L. Bose and R. C. Shah, NCL.

60555. 20 May 1957 : **Production of liquid rubber**—Uma Shankar, NCL [Group XII(1)].



Liquid rubber is produced by heating solid rubber in a non-oxidative atmosphere at 290°C to 310°C. The volatile matter can be recovered by a suitable condenser or let off if desired.

Example

Solid rubber is placed inside a sloping tube through which a current of pure nitrogen is passing and electrically heated at 300°C. The liquified rubber flows down and collects in a receiver and is drawn off as required. The dimensions of the tube depend on the quantity of production desired.

A plant to make liquid rubber by the above process and consisting of an electrically heated metal retort for heating the rubber and a receiver with a condenser for collecting the liquid rubber is characterised in that a sloping tube retort with sieves inside is provided to facilitate the flow of rubber heated in a non-oxidation atmosphere and to strain and fluid rubber free of solid rubber.

60556. 20 May 1957 : **A new process for the manufacture of spherical crystals of alkali halides**—G. I. Finch, B. K. Shukla and D. J. Mehta, CSMCRI [Group V].

Evaporating with stirring in vessel having element of a symmetry.

60732. 8 June 1957 : **Galvanic current generation in the utilization of metal and alloy scraps containing copper**—V. Aravamuthan, CECRI.

60733. 8 June 1957 : **Galvanic current generation in the utilisation of metal and alloy scraps containing lead**—V. Arvamuthan, CECRI.

60734. 8 June 1957: **Galvanic current generation in the utilization of metal and alloy scraps containing iron**—V. Aravamuthan, CECRI.

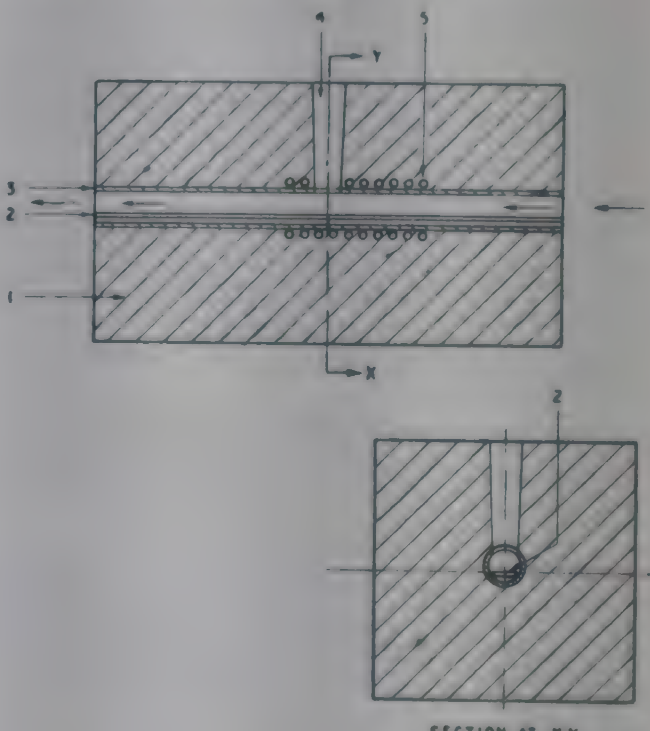
60826. 18 June 1957 : **Improvements in or relating to the production of hydroxy, alkoxy or aryloxy substituted deoxybenzoins and particularly of deoxyanisoin**—J. L. Bose and R. C. Shah, NCL [Group IX(1)].

The invention relates to an improved process for the production of hydroxy, alkoxy or aryloxy substituted deoxybenzoins of the general formula R. CO-CH$_2$-R′ wherein R stands for a hydroxy, alkoxy, or aryloxy substituted aryl radical and R′ stands for an aryl radical which may or may not be substituted which consists in causing a phenol or a phenol ether to react with a substituted or unsubstituted arylacetic acid using a mixture of phosphorous oxychloride and anhydrous zinc chloride as a condensing agent. Particularly deoxyanisoin is prepared by causing anisole to react with *p*-methoxy phenylacetic acid using a mixture of phosphorous oxychloride and anhydrous zinc chloride as a condensing agent. Inert solvent like tetra-chloroethane is used as a diluent and the reaction is carried out at 0–110°C. The crude ketones are obtained in good yield by decomposing the reaction mixture with ice and are then purified. Alternatively some phosphorous oxychloride is recovered from the reaction mixture by distillation under reduced pressure and the residual product is then treated with ice.

60827. 18 June 1957 : **The isolation of a therapeutically active antibiotic and antiviral principle from withania somnifera (Solanaceae)**—P. A. Kurup, CDRI [Group XIX(1)].

Extracting the active principle of the plant withania somnifera with an organic solvent other than petroleum ether.

60828. 18 June 1957 : **Manufacture of artificial porcelain teeth**—Atma Ram, N. V. Raghunath and S. K. Chakrawarty, CGCRI [Group XIX(2)].



SECTION AT X-Y

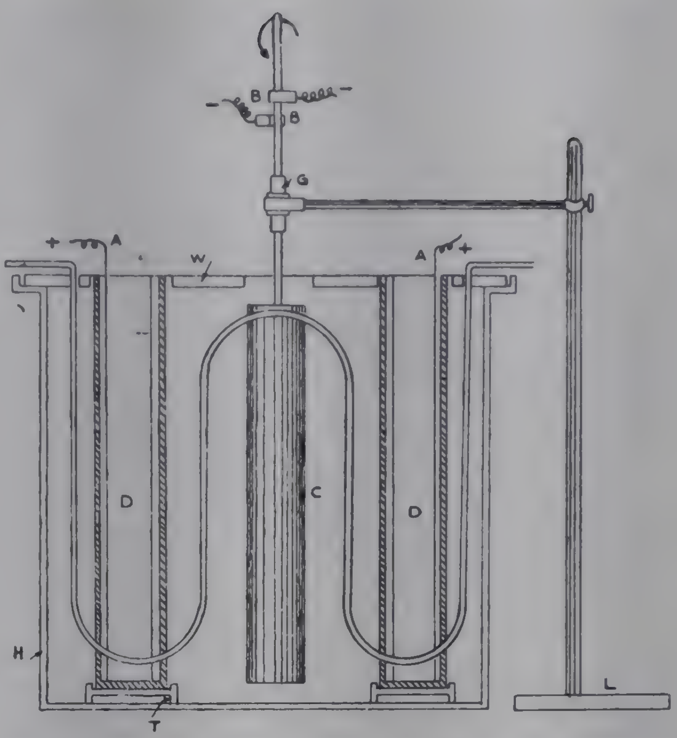
The process of manufacture of artificial porcelain teeth consists in mixing together a dental porcelain body and a stain-making teeth by pressing in mould and fixing gold coated nickel pins at the back of the anterior teeth wherein the dental porcelain body has a chemical composition containing 47·0–86·0% of SiO$_2$, 14·0 to 24·0% of Al$_2$O$_3$, 0·0 to 0·1% of TiO$_2$, 0·2 to 0·5% of CaO MgO and 10·0 to 15·0% of K$_2$O Na$_2$O. The stain has a composition containing 40–60% of Rutile, 0·5–5% of vanadium pentaoxide and 40–60% of felspar. The said dental porcelain body is matured at 1200–1350°C while stains are calcined at 800–1300°C and ground and washed before being admixed with the porcelain body. The holes are made in the back of the teeth in green stage palladium anchorages are put therein and teeth placed in refractory trays 2 are fired in an electric furnace 4 at 650–800° so that a piece of silver solder 3 soaked with flux put into the anchorage melts. A pin 2 is then put into the anchorage through an opening at the top of the furnace and the teeth 4 is pushed in cooling zone of the furnace. The furnace (4) has an electric heating element (5) wound around refractory tube (3) surrounded by heat insulating refractory bricks (1).

60863. 24 June 1957: **Manufacture of 1-ethoxy 2-hydroxy propenyl benzene**—S. Mahboob, U. D. N. Sastri, K. Ramachandran and S. H. Zaheer, RRL, Hyderabad [Group IX(1)].

Process for manufacture of 1-ethoxy-2-hydroxy-4-propenyl benzene, which can be used as a flavouring agent in food pharmaceuticals and cosmetics consists in heating 1-ethoxy-2-methoxy-4-pharma-allyl benzene or 1-ethoxy-2-methoxy-4-propenyl benzene with an alkalimetal alkexide or alkalimetal hydroxide in a polyhydric alcohol at 150–200°C for 4–8 hours and separating the product by precipitating by addition of CO_2. The reaction may be carried out in presence of ethers like monomethyl moncethyl or monobutyl ethers or propanol or butanol. The final product may be separated from the reaction mixture by pouring it in water, filtering, acidifying the filtrate with mineral acid, filtering again and recrystallising the product from a solvent such as ethyl alcohol. The transform of 1-ethoxy-2-methoxy-4-propenyl benzene by heating the reaction product with potassium hydroxide, triethanolamine and ethylene glycol.

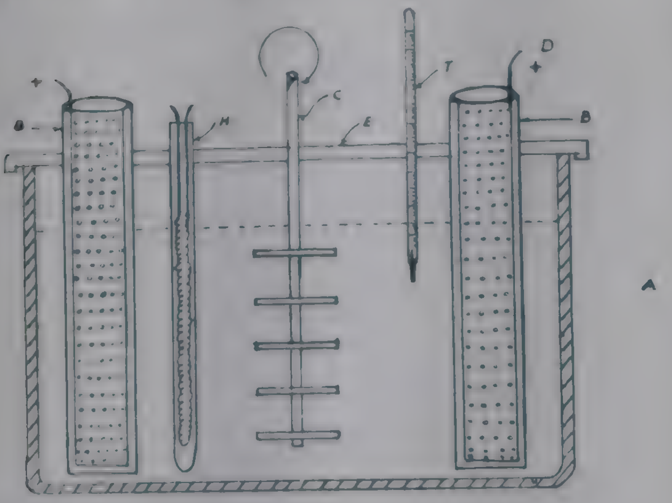
60864. 24 June 1957: **Improvements relating to the electrolytic preparation of salicylaldehyde**—H. V. Udupa and B. B. Dey, CECRI [Groups IX(i) and LVIII(5)].

Improved electrolytic process for preparation of salicylaldehyde to that described in Indian Patent No. 52631 consists in the electrolytic reduction of salicylic acid using sodium sulphate on sodium chloride as electrolyte in the presence of boric acid, wherein a critical *p*H of 5·4 to 6·0 is maintained at a temperature not exceeding 25°C and using a current density of 2·15 amp./dm² and wherein an aqueous solution of salicylic acid and sodium sulphite (resulting in the formation *in-situ* of sodium salicylate and sodium bisulphate in aqueous solution) is added to the catholyte. This aqueous solution may be added stage-wise in a quantity proportional to the current passed during electrolysis. The aldehyde formed is separated by neutralising the catholyte with sulphuric acid or hydrochloric acid and steam distilling. The apparatus for carrying out the electrolysis consists of a cell container H of hard rubber having two alumic porous cylindrical diaphragms D, D kept on either side of a rotating amalgamated cylindrical cathode C upon perspex tripods T.T. Two lead cooling coils F pass through openings E in wooden lid while two cylindrical leads A, A are kept inside the porous pots D, D. The solutions are added through opening K in the lid. The process is preferably carried out at temperature not exceeding 25°C using a current density range of 2 to 15 amp/dm² at a critical catholyte *p*H range of 5·4 to 6 but preferably 5·7.



60865. 24 June 1957: **Improvements in and relating to the electrolytic reduction of m-dinitrobenzene to 2:4 diami-**

nophenol—G. Srinivasan Subramanyan, H. V. Udupa and B. B. Dey, CECRI [Groups IX(1) and LVIII(3)].



The invention provides a process for the preparation of 2 : 4-diamonophenol which consists in the electrolytic reduction of m-dinitrobenzene using 30 to 60% sulphuric acid as catholyte but preferably sulphric acid of 50% strength, and wherein a rotating cathode is employed.

The cell set up is represented in Fig. 1. A is a ceramic vessel. It contains a lead-lined wooden cover E. Two porous pots B, B, serve as anode chambers. The anodes are perforated lead sheets. The cathode is amalgamated monel disc type C.

Example

A cylindrical cathode of lead ½″ diameter and 5″ long was used and rotated by means of a fractional horse power motor inside a porous pot which acted as cathode chamber. The pot was kept inside a beaker which served as anode chamber with a cylindrical lead anode. 40% sulphuric acid was the anolyte and 50% sulphuric acid catholyte. 1% copper sulphate was taken in the catholyte. Cathode current density was 30 amp/dm². Temperature was 100°C. Depolariser ratio weight volume of catholyte was 1 : 18. 100 c.c. of catholyte was taken and 5·6 g. m-dinitrobenzene added. 2 : 4-diamino-phenol sulphate was isolated. In the first run the yield was 38%. The yields in the second and third runs were 52·3% and 55·3%, respectively giving an overall yield of 48·5% for the three trials using the same acid.

Indian Specification No. 35328 has been referred to.

60866. 24 June 1957 : **A process for the preparation of an adsorbent clay from alluvial soils like Chickni Mitti for the recovery of vitamin B_2 (Riboflavin) from natural sources or fermented products**—S. C. Agarwala and T. Sen, CDRI [Group IV(1)].

Process for preparation of adsorbent clay for use as an adsorbent in the isolation of vitamin B_2 (riboflavin) from natural sources or fermented products, from Indian earths, consists in boiling alluvial soils like "Chikni mitti" with conc. mineral acid, washing the treated product free of acid, removing silica therefrom and drying the silica free material and heating it at 200—400°C for 2-4 hours. Thus the soil sieved to 80—100 mesh may be boiled with Hcl for 1/2-1 hour and silica removed therefrom the centrifugation. The dried material may be powdered and sieved to 120—150 mesh.

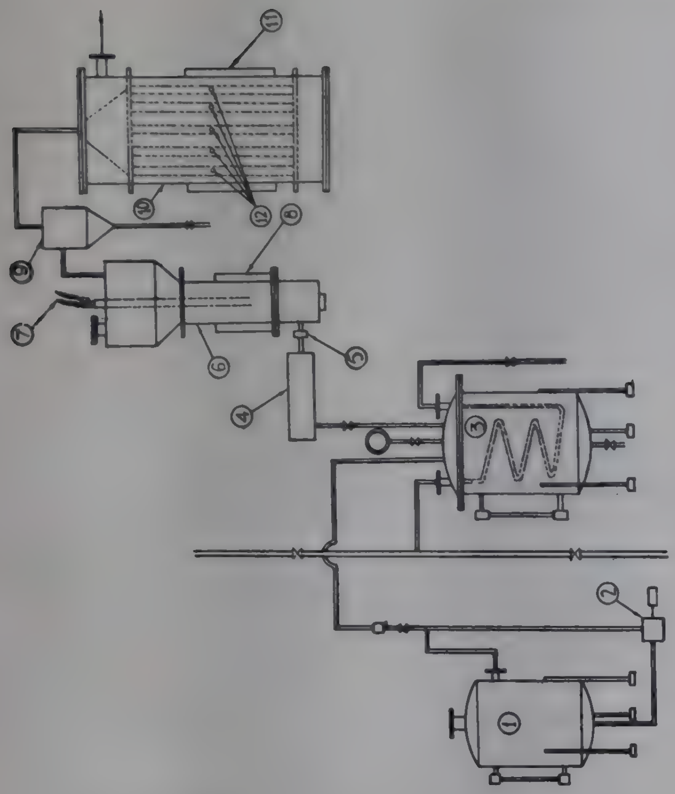
60867. 24 June 1957 : **Processing of banana pseudo-stem for use as cushioning material**—N. V. R. Iyengar, B. Ananda Swamy and H. B. N. Murthy, CFTRI [Groups XXII(1) and LII(4)].

A process for processing banana pseudostem into a material having cushioning properties suitable for packaging or like purposes consists in immersing the pseudostem in an aqueous solution of metallic salt and drying the soaked material.

60921. 27 June 1957 : **Improvements in the method for manufacture of ether**—V. V. Deshpande, A. Ramalingam and N. R. Kuloor, SRIFIR [Group IX(1)]

The invention relates to the manufacture of ether and particularly to the manufacture of diethyl ether from ethyl alcohol and to the equipment for the same.

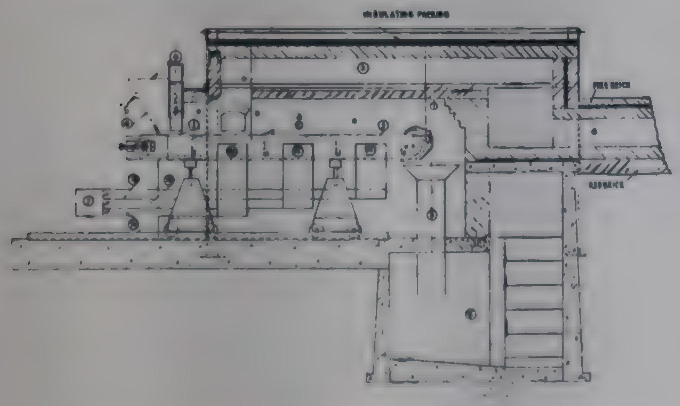
The process for manufacture of ether consists of vapour phase catalytic dehydration of alcohol using a combination of fluidized and static beds of catalyst material, consisting of a compound of aluminium such as activated aluminium oxide, activated bauxite or dehydrated alum at a temperature of 175-275°C.



The apparatus for carrying out the process comprises of broadly, an alcohol boiler (3) a fluidized bed catalyst chamber (6) a static-bed catalyst chamber (10), into which the vapours are passed in combination with means such as condensers (13, 15) or rectifying columns for separating ether, alcohol, water and ethylene, if any, from the vapours coming from the catalyst chamber.

Indian Patent No. 49836 has been referred to.

61020. 6 July 1957: **Continuous devolatilisation of fuels on a moving bed**—A. Lahiri, S. K. Das Gupta, M. N. Das Gupta and A. K. Bose. CFRI [Groups XXXII(1) and XXXII(2)].



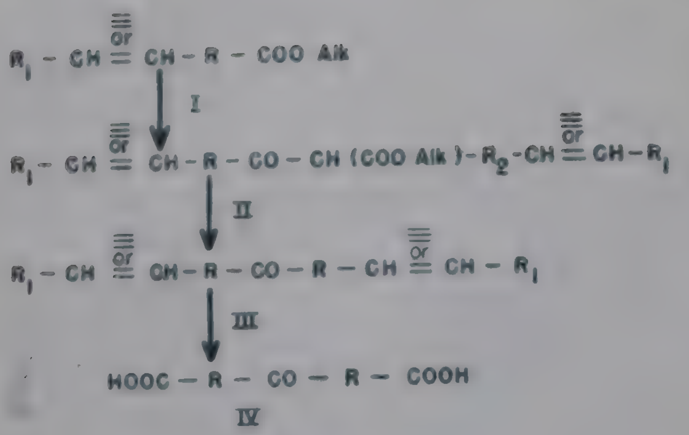
Relates to a process for the production of devolatalised products such as domestic coke or the like from fuel materials such as coal. The process consists in carbonising the fuel materials by heating them on a moving grate inside a coking chamber, wherein the heat of carbonization is provided by burning the volatile matter of the fuel materials. The fuel materials subjected to volatalisation consist of coal or lignite, which do not disintegrate or fuse in the process of heating, or briquettes of such fuels with or without a binder or briquettes prepared from char coal, lignite or the like in admixture with metal-scraps or ores (such as iron ore, zinc ore, bauxite, limestone or the like) with or without a binder, which do not disintegrate or fuse on heating of the moving bed.

Fuel or briquette of desired size and quality is fed from a hopper *4* either after preheating or as such the depth of the fuel bed on the moving grate *2* is controlled by an adjustable grate *1*. The fuel is ignited in the preignition zone just after *1* by supplying the required quantity of air either as such or after preheating through the *7-a*. A further supply of air is GIVEN at *7-b* and *7-c*. The hot gases after imparting necessary heat to the fuel bed are removed through a channel *3*. The furnace containing the moving grate is designed such that heat rays are reflected back on the moving grate carrying the fuel. On completion of devolatilisation the devolatilised fuel falls through a chute *5* to a chamber *6* with a water seal. Where a dry quenched product is required the water seal should be eliminated. The quenched product can be removed continuously by a suitable device from chamber *6*.

61320. 1 August 1957: **Improvements in or relating to the preparation of active carbon**—K. K. Roy, N. G. Basak and A. Lahiri, CFRI [Group IV(2)].

Active carbon is prepared by carbonizing crushed and sized coal or lignite in fluidized bed in the presence of steam or a mixture of steam and air which is introduced during carbonization. The resulting coke or char is subjected to air activation also in a fluidized bed.

Indian Specification No. 48385 is referred to.



$R = -(CH_2)_7-$ or $-(CH_2)_8-$

$R_1 = CH_3-(CH_2)_7-$ or CH_3- or $H-$

$R_2 = -(CH_2)_6-$ or $-(CH_2)_7-$

61439. 13 August 1957/Divisional date 16 November 1956: **Preparation of 2-hydroxy and 2-chlorothiazoles containing phenolic residues in position 4**—K. S. Narang, H. S. Sachdev and K. S. Dhami, Panjab University [Group IX(1)].

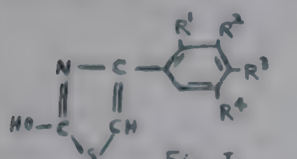
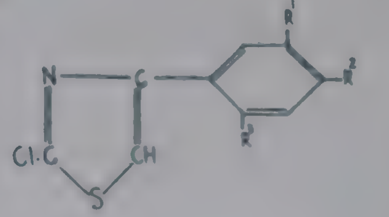
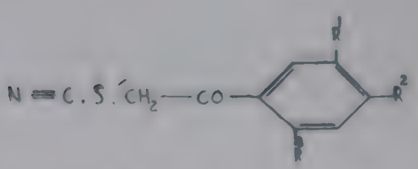


Fig. I





Relates to a process for the manufacture of 2-chlorothiazoles of the general formula shown in fig. II of the drawings wherein B_3 is a hydroxy group and of R_1 and R_2 one is hydrogen and the other is hydrocarbon radical, by reacting α-thiocyanoketone of the general formula shown in fig. III of the drawings, with dry HCl. The reaction is carried out in an inert solvent like other.

Example

2 parts of W-thiocyano-3-methyl-G-hydroxy-acetophenone is taken up in 80–120 parts of dry ether which is then saturated with dry hydrochloric acid at 0°–10°C. Ether is then removed by distillation and the residue triturated with dilute sodium carbonate or sodium bicarbonate solution in the cold, filtered, washed with water and is crystallised from dilute ethanol. There is thus obtained 2-chloro-4-(3'-methyl-8'-hydroxy) phenyl thiazole mp. 99-100°C.

Indian Specification No. 58902 is referred to.

61484. 20 August 1957: **Improvements in or relating to refining and utilization of cotton seed oil**—
[Groups XI(1) and XLIII(4)]

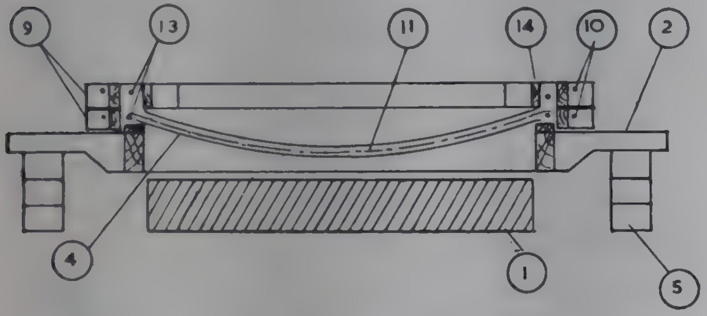
Process for refining crude or raw cotton seed oil, semi-refined cotton seed oil or hydrogenated cotton seed oil comprises adding to the oil an aqueous solution of borax, sodium borate, a water soluble borate, or a combination of boric acid and alkali and thoroughly mixing the same.

From 0·01 3 g. or more of borax, sodium borate, a water soluble borate or a combination of boric acid and alkali as an aqueous solution may be added to each 1000 g. of the oil. The aqueous solution may have a concentration of 0·01 and 10% and mixing may be done at 20°–95°C for 2-50 mts. The oil may be then filtered to remove oil in soluble complexes formed therein. The oil thus obtained is then neutralised by direct treatment with alkali solution. The alkali added may be an excess of about 0·05 to 100% or more over the free fatty acid content of the oil.

61585. 30 August 1957: **A process for the manufacture of an ammonium phosphate—sulphate fertiliser**—J. Gupta, K. Seshadri, J. Lobo and M. N. Rao, NCL [Group I(4)].

Ammonium phosphate sulphate fertilizer is prepared by a process which comprises the steps of reacting a calcium phosphate mineral with ammonium bisulphate, extracting with water the reacted charge and evaporating the aqueous liquor after neutralisation to dryness. The ammonium bisulphate is prepared either by mixing stoichiometric proportion of ammonium sulphate and sulphuric acid or by thermal decomposition of ammonium sulphate, and is used in the form of a solution, whose concentration may vary from 40% (w/v) to the point of saturation. The reaction between rock phosphate and ammonium bisulphate is achieved after thoroughly mixing them with or without the application of external heat. After the reaction the charge is extracted with water, by keeping the product stirred in hot water in order to help the precipitation of calcium sulphate. The water extract is neutralised with ammonia to a *p*H between 4 to 6 and then evaporated to dryness to yield the solid fertiliser.

61645. 5 September 1957: **A new process for the manufacture of precast doubly curved shell elements for roofs, floors and panel walls**—G. S. Ramaswamy and S. M. K. Chetty, CBRI [Group XXV(1)].



A process for the manufacture of precast doubly-curved shell elements for roofs, floors, or panel walls, which consists in providing a flexible mould of hessian *4*, providing a support *5* underneath the hessian *4*, casting cement concrete, lime surki or light-weight concrete using the flexible mould of hessian, and thereafter lifting the mainframe *2* off of the support 5 allowing the hessian with the concrete to sag and take the shape of a doubly curved shell before the cast material is set, and thereafter removing it from the mould, inverting it and using it after it is set.

61771. 18 September 1957: **An Improved process for the conversion of high sulphur coals into ion exchanger for water softening and the like**—M. S. Iyengar, S. Huha, M. L. Beri and A. Lahiri, CFRI [Group II(4)].

Process for preparing ion exchangers for use in water softening from high organic sulphur coals, comprises oxidising these coals vigorously either in a static or fluidized bed with (i) oxidising agents like NO_2, HNO_3 or $KmnO_4$ or (ii) simply air or oxygen at temperature varying from room temperature to 300°C to convert SH groups present in said coals to SO_3H groups. The preferred temperature of the reaction may be upto 200°C with oxidising agents other than HNO_3. The high sulphur coals when used for this process may be pre-oxidised partially or wholly and then sulphonated with sulphuric acid with or without pretreatment with anthracene oil. Thus an ion exchanger containing sulphonic groups is obtained whereby all the sulphur occurring as thiophenol or thiophene in high sulphur coals are converted into sulphonic acid groups by this process.

61772. 18 September 1957: **A method for the isolation of psoralen-isopsoralen mixture from the seeds of Psoralea corylifolia (Babchi)**—S. Bhattacharji and M. L. Dhar, CDRI.

61773. 18 September 1957: **Improvements in or relating to refining and utilization of cotton seed oil**—T. R. Seshadri and Kailash Chander, Delhi University.

61774. 18 September 1957: **A process for the manufacture of magnetic oxide of iron**—K. C. Srivastava and O. P. Kulsreshtha, NPL [Group III].

Calcining ferrous oxalate in an atmosphere of inert gas.

61801. 20 September 1957: **An electrochemical process for the production of aluminium hydroxychloride**—A. Jaga Rao and B. A. Shenoy, CECRI [Groups III and LVIII(5)].

In a process for the electrochemical production of aluminium hydroxychloride which consists in electrolysing an aqueous solution of aluminium chloride in an electrolytic cell a conductor such as carbon or graphite slab which does not dissolve in $AlCl_3$ is used as cathode; an aluminium sheet serves as a dissolving electrode (anode). The chlorine produced *in-situ* due to passage of the current reacts with the aluminium at the anode, giving aluminium chloride thereby which then goes into solution in the electrolyte and adds to the aluminium chloride content of the electrolyte. The electrolysis may be carried out in an undivided cell. As anode, aluminium scrap cast into slabs may be used. The electric current density is maintained between 40—150 amps/sq. ft. The terminal voltage is maintained in the range of 1—50 volts.

61978. 12 October 1957 : **Nickel-free-chromium-manganese-nitrogen stainless steel (Type 1)**—B. R. Nijhawan, P. K. Gupta, S. S. Bhatnagar and B. K. Guha, NML [Group XXXIII(4)].

An austenitic stainless steel has for its essential constituents the elements chromium (16—22%), manganese (12—15%), nitrogen (0·5-1%), carbon (upto 0·12%), sulphur (upto 0·06%), phosphorous (upto 0·06%), silicon (upto 1%) and iron (remainder). The alloy may also contain 0·8—1·2% of copper. Suitable raw materials for the production of the alloy are low-carbon ferro-chrome with or without nitrogen, nitrided electrolytic manganese, nitrided chromium, copper, ferrosilicon and steel scrap.

Example

279 parts of nitrided electrolytic manganese containing 5% N were charged in a high frequency furnace and were covered with broken pieces of low carbon ferro-chrome and the furnace was started. The rest of the required ferro-chrome was added on softening of the first charge. A total of 475 p. of low-carbon ferro chrome containing 70·7% Cr and 0·04% C were used. On melting 1163 p. of low-carbon iron were slowly added. The furnace was run for about 10 minutes for the melts to attain the temperature of 1510°C. Nine parts of ferro-silicon were then added. The molten charge was then poured in a cast iron split ingot mould dressed with lime and dried previously. The ingot top was sealed with plunger and a high-velocity jet of water was impinged on the top of the plunger. Drillings from the ingot gave the following analysis :—

Cr (17·6%), Mn (13·5%), N (0·54%), C (0·05%), Si (0·26%), S (0·015%) and P (0·023%).

61979. 12 October 1957 : **Nickel-free - chromium - manganese - nitrogen stainless steel (Type 2)**—B. R. Nijhawan, P. K. Gupta, S. S. Bhatnagar and B. K. Guha, NML.

61980. 12 October 1957 : **Nickel-free-chromium-manganese-nitrogen stainless steel (Type 3)**—B. R. Nijhawan, P. K. Gupta, S. S. Bhatnagar and B. K. Guha, NML.

61981. 12 October 1957 : **A process for making completely stabilized dolomite refractories**—M. R. Rao, P. C. Sen, and H. V. B. Rao, NML [Groups XXV(1) and XXV(2)].

A method for making completely stabilised dolomite refractories consists in adding silica and/or silicate and also B_2O_3 or P_2O_5 or Cr_2O_3 to dolomite. These are thoroughly mixed and calcined between 1400 to 1650°C so that the dolomite refractory is completely stabilized by keeping the line-silica maler ratio between 2 to 3·5 in the calcined product. The source of silica is either quartz or quartzose rocks or magnesium silicate rocks such as serpentine, dumite, sexonite and taleschist.

62159. 31 October 1957 : **Compositions having newly discovered medicinal properties from bitter constituents of nim**—C. Mitra, NCL.

62261. 12 November 1957 : **A temperature sensitive ceramic composition having medium permittivity and retraceable characteristics**—T. V. Ramamurti, C. V. Ganapathy, R. Krishnan, Aftab Ahmad and K. Vaitheswaran, NPL [Groups XXV and LVIII (2)].

Relates to a ceramic composition having a medium value of dielectric constant and variation of permittivity with temperature which comprises titanium dioxide, barium oxide and zinc oxide to which is added urium oxide to impart properties of nearly linear variation of dielectric constant with temperature and reproducible characteristics. This composition after sintering have large i.e. a temperature co-efficient ranging from 0·3% per °C to 4% per °C and nearly linear variation of dielectric constant with temperature and having 500 to 300 medium dielectric constants.

62262. 12 November 1957 : **Improvements in or relating to detoxification of cotton seed products such as cotton seed meal or cotton seed flour**—T. R. Seshadri and Kailash Chander, Delhi University [Groups 1(2) and 1(3)].

Process for detoxification of cotton seed products such as cotton seed meal or cotton seed flour, so that these can be used extensively for feeding purposes, consists in removing the gossypol from the cotton seed product by treatment with an aqueous solution of borax, sodium borate, a water soluble borate or a combination of boric acid and alkali. The gossypol solution is then removed by decantation, filtration or centrifugation. The amount of borax, sodium borate or the like used is in excess or that required for the gossypol content of the cotton seed product. The treated cotton seed meal thus obtained is thoroughly washed to remove last traces of borax or the like and the meal is then dried under vacuum.

62263. 12 November 1957 : **A process for the separation of tallow and tallow-like fatty acids into mainly saturated and mainly oleic acids**—S. H. Zaheer, V. V. R. Subrahmanyan and K. T. Achaya, RRL, Hyderabad [Groups IX (1) and XI (3)].

The invention relates to a process for the separation of tallow and tallow-like fatty acids into mainly saturated and mainly oleic acid which consists in dissolving the mixed fatty acids in aqueous ethanols and crystallising to obtain the two products. The crystallisation is effected at a temperature range of —5 to —12·5°C from 80 to 85% aqueous ethanols at a solvent/acid ratio of 5 to 10.

U.S. Patent No. 2293676 and British Patent No. 632583 are referred to.

62292. 16 November 1957 : **Electro-winning of zinc of recovery elemental sulphur from zinc sulphide ores**—V. Aravamuthan and R. Srinivasan, CECRI [Groups IV (2) and LVIII (5)].

A process for the production of zinc consists in leaching zinc sulphide concentrate of —250 mesh size with ferric chloride solutions to obtain a zinc chloride solution (and a residue from which elemental sulphur can be obtained as a useful by-product), and electrolysing the zinc chloride solution thus obtained. The ferric chloride solution used is about 10·25% in strength. The zinc sulphide concentrates are boiled with 1·2 times the theoretical amount of ferric chloride required for a duration of 1-1½ hours to leach out zinc.

62293. 16 November 1957 : **Electro-winning of zinc by electrolysis of zinc chloride solutions**—V. Aravamuthan and R. Srinivasan CECRI [Group LVIII (5)].

The electrolytic process for the production of zinc in the form of easily peelable uniform sheets which consists in electrolysing at 25—35°C zinc chloride solutions containing 100-120 grams of zinc per litre and 0·5 to 1·5 grams of sodium fluoride. The current density of 30 amps/sq. ft. can be employed in a two compartment cell wherein graphite is employed as anode and stainless steel or aluminium as cathode and porcelain, microporous, rubber, PVC or the like, diaphragms are employed.

62302. 18 November 1957 : **A process for the preparation of 1-ω-ketodicarboxylic acid (or ester) suitable for the preparation of civetone and dihydrocivetone**—K. K. Chakravarti and S. S. Bhattacharyya, NCL [Group IX (1)].

A process for the preparation of 1-omega-keto-dicarboxylic acid IV (or ester) of the formula HOOC-R-CO-R-COOH where R= —(CH_2)7-or-(CH_2) 8-consists (1) condensation of ester (1) of unsaturated monocarboxylic fatty acid containing double or triple bond of the formula R_1=CH-CH-R COOH or R_1=C-R-COOH where R is as above defined, and R_1=CH_3-$(CH_2)_7$-, CH_3 or H in presence of Na or K-alkoxides followed by hydrolysis with alcoholic alkali to unsaturated aliphatic ketones (III) of the formula R_1-CH=CH-R-CO-R-CH=CH-R_1 or R_1-C=C-R-CO-R-C=C-R_1, where R and R_1 are as above defined and (2) oxidation of ketone (III) with an oxidising agent such as O_3, KMN_nO_4, per acids, sodium metaperiodate, and lead tetracetate. The compounds are useful in the preparation of perfumery materials e.g., civetone.

62336. 21 November 1957 : **A new process for the conversion of coal, coke or the like into ion-exchanger for water softening, deionisation and the like**—B. K. Mazumdar, S. K. Chakrvbartty, S. N. Roy and A. Lahiri, CFRI [Groups II (4) and IV (1)].

This invention relates to a process for the conversion of coal, coke, anthracite, semi-anthracite and the like materials into ion-exchangers for water softening, deionisation.

It consists in nitrating the materials and reducing the nitrated materials to ion-active i.e. imino (NH) stage. The nitration is carried out by the use of nitrating agent such as (i) mixed acid i.e., nitric acid mixed with a dehydrating acid e.g., oleum, sulphuric acid, acetic anhydride, phosphorous pentoxide; (ii) nitric acid, concentrated and dilute; liquid or vapour; (iii) nitric acid anhydride (di-nitrogen pentoxide); (iv) organic nitrates e.g., acetyl and benzoly-nitrates; (v) alkali nitrates in presence of sulphuric acid; (vi) metal nitrates or ammonium nitrate with acetic acid; and (vii) nitrogen tetroxide. The nitration is done at a temperature of the order of 20°–50°C or below the said temperature range, and the time of reaction extends from half an hour to two hours.

62337. 21 November 1957: **Improvements in the preparation of nitrogenous fertilizers from humic acids and the like**—P. N. Mukherjee and A. Lahiri, CFRI [Group I(4)].

A method of producing organic nitrogenous fertilizers from fossil fuels (like peats, lignites, coals of different ranks), composts, decomposed vegetable debris, saw dust, lignins, wood or the like material consists in subjecting the material to the simultaneous action of air-ammonia mixture or oxygen-ammonia mixture at ordinary pressure or at elevated pressure, upto 50 atmospheres, and at temperatures ranging from 30° to 400°C.

The reactions are carried out in a static bed, or rotary bed or in a fluidized bed.

Refers to Indian Patent Nos. 53347 and 53527.

62338. 21 November 1957: **An improved method for producing nitrided manganese**—T. Banerjee, P. P. Bhatnagar and M. K. Gupta, NML [Group XXXIII (1)].

A method of production of nitrided manganese consists in heating the manganese metal in an atmosphere of nitrogen at 1000°–1100°C. The manganese metal used for nitriding is substantially free from iron and chromium. The nitrogen used is substantially free from any oxygen. The reaction is carried out at atmospheric pressure or at below or above the atmospheric pressure. The reaction product is gradually cooled in the atmosphere of nitrogen upto the room temperature, keeping the pressure of the system more or less constant. The nitrided manganese obtained contains about 6·2% nitrogen.

62352. 22 November 1957: **Refractory compositions comprising graphite and alumino silicate materials and glazes to render such compositions resistant to oxidation**—T. V. Prasad and H. P. Srinivasamurthy, NML [Group XXV(2)].

Compositions for dense refractory bodies comprises (I) mainly of 20–60% graphite and (II) 20–60% of plastic refractory clay or clays having a silica 1, alumina ratio between 1–19 and 4–56, and (III) upto 20% of other minor additions such as alumino-silicate materials like felspar, the latter two ingredients, namely (II) and (III) acting as bonds on firing. A porcelain body, mix consisting of quartz, china clay, plastic fire clay and felspar may replace the clays either in part or in whole.

Crucibles are fabricated out of the above compositions after they are thoroughly mixed and aged, by plastic pressing semi-dry pressing or by juggering. The fabricated crucibles are coated, on drying, with two layers of different glazes, the undercoats being substantially a mixture of quartz, rouge and pyrolusite (with minor additions of china clay, felspar, borax and sodium silicate) and the upper coat comprising mainly of felspar, quartz, and whiting (with minor additions of $BaCO_3$ MgO, ZnO, Fe_2O_3, MnO_2, sodium silicate and plastic clay).

Indian Patent No. 58869 is referred to.

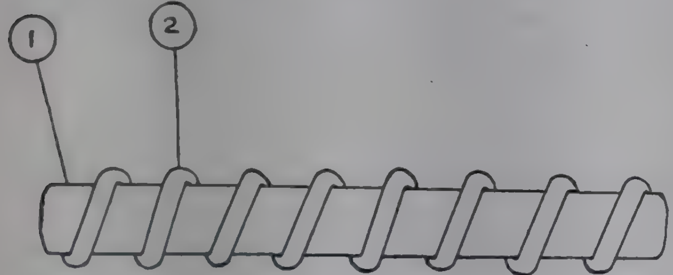
62379. 25 November 1957: **Improvements in or relating to the electrolytic preparation of manganic sulphate**—H. V. Udupa, M. S. Venkatachalapathi and R. Ramaswamy, CECRI [Groups III and LVIII(5)].

A process for the electrolytic preparation of manganic sulphate by the electrolytic oxidation of manganous sulphate in the presence of sulphuric acid, consists in using manganous sulphate in the form of a suspension in sulphuric acid resulting in a suspension of manganic sulphate in sulphuric acid. The suspension of manganous sulphate (from 50 to 350 gm. per litre) in sulphuric acid (50 to 65% strength) is oxidized in undivided electrolytic cell, and the oxidation is brought about at a temperature ranging from 30° to 100°C.

62426. 29 November 1957 : **A process for the oxidation of toluene to benzaldehyde**—H. V. Udupa, M. S. Venkatachalapathi and R. Ramaswamy, CECRI [Group IX(1)].

Oxidising toluene with manganic sulphate.

62490. 6 December 1957 : **A process for creating deformations in the cable ducts in prestressed concrete structure**—S. K. Narayana and S. M. K. Chetty, CBRI [Group XXVI(I)].



Creating deformation in cable ducts in prestressed concrete structure, by forming deformations around the cable opening.

62497. 13 November 1956/7 December 1957 : **A process for the fractionation and isolation of the individual cardioactive glycosides of digitalis**—M. M. Dhar, N. M. Khanna and M. L. Dhar, CDRI [Group IX(1)].

Cardioactive glycosides of digitalis are fractionated and individual components are isolated by absorption chromatography over alumina.

Example

1000 gms. of powdered well preserved Digitalis lanata leaves are percolated with ethanol. The combined percolates are evaporated to a small volume and extracted with benzene to remove chlorophyl etc. The glycoside tannates are then extracted with chloroform, the chloroform removed and the residue taken up in alcohol and treated with barium carbonate. The solid is removed by filtration and washed with alcohol and the alcoholic solution evaporated to dryness. The residue is taken up in absolute chloroform and applied to the top of a column in chloroform of 200 gm. of Merch's activated alumina, partially deactivated by contact with acetone for 30 mintutes. Elution is carried out first with absolute chloroform and then with chloroform containing progressively increasing concentration of alcohol. Digitoxin is obtained from the absolute chloroform elutes, then comes substance D with chloroform alcohol (95 : 5), gitoxin with chloroform alcohol (90 : 10) and digoxin with chloroform alcohol (85 : 15). The lanatosides are then eluted with ethanol. Digitoxin, gitoxin and digoxin are finally obtained in a pure state by crystallisation from usual solvents.

Indian Patent Application No. 58870 is referred to.

62751. 6 January 1958 : **Manufacture of cellulose carboxyalkyl ethers**—C. D. Dhariyal and V. B. Chipalkatti, SRIFIR [Group X].

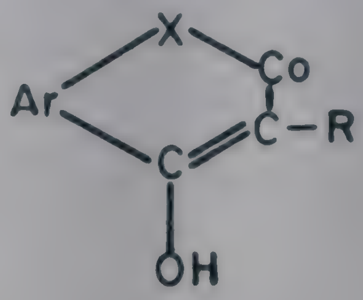
A process for the manufacture of carboxy alkyl cellulose ether, by reacting cellulose, alkali and etherifying agent in a suspending medium to maintain the product viz., cellulose ether in an undissolved state is characterised in that the suspending medium consists of ethyl alcohol. The proportion of cellulose to alcohol is from 1 : 15 to 1 : 20 by weight. The etherifying agent consists of a halogenated aliphatic acid or its sodium salt such as chloracetic acid, chlorpropionic acid or the like. The cellulose used consists of cotton lints, ramie fibre or the like. The alkali used consists of sodium hydroxide or potassium hydroxide. The molar ratio of alkali to cellulose is from 5 : 1 to 7 : 1. The cellulose is powdered to get a product of 30—100 mesh size. The reactants are kept agitated in the suspending medium, which may be heated and maintained at 30° to 70°C till cellulose is etherified.

62890. 20 January 1958 : **A new process for the production of 4-hydroxy coumarin and its derivatives**—V. R. Shah, J. L. Bose and R. C. Shah, NCL [Group IX(1)].

Aromatic hydroxy or thio compound having at least one ortho position free is reacted with a malonic acid or its lower alkyl ester in the presence of a mixture of $POCl_3$ and anhydrous $ZnCl_2$.

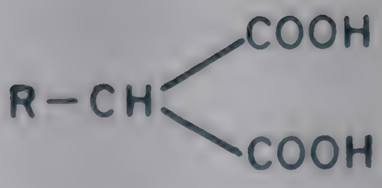
62938. 25 January 1958 : **A process to produce dense carbon aggregates from carbonaceous materials of varied volatile contents**—H. P. Srinivasamurthy and P. Prabhakaram, NML [Group XXXII (2)].

I



II $Ar-X-H$

III



$$R-CH\begin{cases}COOH\\COOH\end{cases}$$

Mixing crushed carbonaceous material with pitch and/or coal tar, briquetting the mixture, heating the briquettes and then crushing to desired grain sizes.

62939. 25 January 1958: **Improvements in or relating to curing catalyst for the treatment of textiles materials with aminoplast resins**—V. B. Chipalkatti, K. V. Ramalingam and N. B. Sattur, SRIFIR [Groups IV (1) and XXIII].

A curing catalyst for the treatment of textile materials with aminoplast resins which consists of a product formed from (i) boric acid and (ii) aliphatic poly hydroxy compound having at least three hydroxyl groups, such as glycerol, glucose, mannitol or the like. Preferably the polyhydroxy compound has attached at least three hydroxy group attached to 3 different carbon atoms. The process for the treatment of textile carbon atoms. The process for the treatment of textile materials with aminoplast resins consists in heating the textile material at 120°—160°C with the said resin and the said catalyst when the impregnated textile material is being dried and baked the concentration of the catalyst components in the textile material is increased tremendously, thus producing the acidity sufficient to accomplish the hardening and polymerisation of the resin.

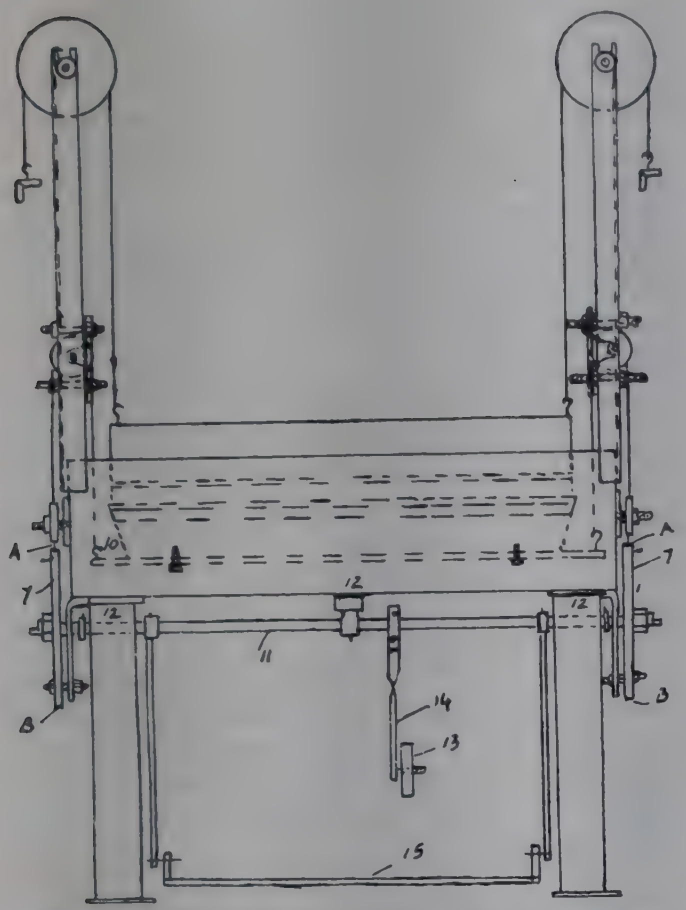
63083. 10 February 1958: **A new method for the preparation of 4-hydroxy coumarins**—V. R. Shah, J. L. Bose and R. C. Shah, NCL [Group IX (1)].

Treating malonic acid diaryl esters with phosphorus oxychloride and anhydrous zinc chloride at 0—110°C.

63199. 20 February 1958 : **A new process for the prevention of the formation of adherent scales of calendria tubes of sugar factories**—S. Ramachandran and S. R. Rajagopalan, CECRI.

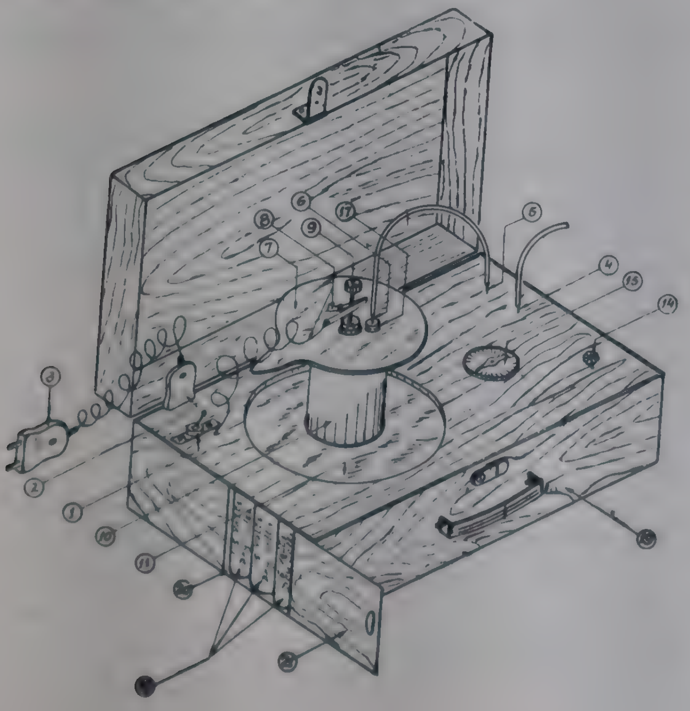
63289. 3 March 1958: **Improvements in or relating to vats for making handmade paper**—G. S. Chowdhury, M. K. Chari, S. R. Amrit Rao, Saletore and S. H. Zaheer, RRL, Hyderabad [Group XXIV (4)].

A vat particularly suited for making hand made paper consists of a water tank 1 in combination with a sieve 2 on which processed pulp can be distributed wherein a mechanical arrangement is provided to lift the sieve upwards steadily and wherein the said mechanical arrangement consists of plurality of ropes with one end of each rope attached to the sieve 2 and remaining ends are suitably attached to rotatable wheels 3 rigidly mounted on a shaft 4 for the uniform movement of the sieve upon rotation of the shaft.



63353. 10 March 1958: **A process for the preparation of 2-substituted amino-5-methyl 2-thiazolines**—K. S. Narang, H. S. Sachdev and K. S. Dhami, Panjab University.

63659. 7 April 1958: **An Improved vacuum tester for canned foods**—J. S. Pruthi, G. Lal and S. K. Lakshminarayana, CFIRI [Group XIV (5)].



A suitable step-down transformer, a double-pole-double-throw switch and suitable plugs are provided for operation.

63685. 7 April 1958: **A process for the manufacture of light constructional material such as hard boards, laminates blocks or the like**—V. N. Badami, C. S. B. Nair, A. N. Basu and A. Lahiri, CFRI [Group XXIII].

Fibrous material is impregnated with a resin obtained by condensing with an aldehyde an alkali extract of tar acids.

63719. 10 April 1958: **A process for the production of alkyl eugenols**—S. Maboob, C. C. Reddy and S. H. Zaheer, RRL, Hyderabad [Group IX (1)].

Alkylating cinnamon leaf oil or clove oil in the presence of an alkali.

63735. 15 April 1958: **A process for the preparation of mycobacellin, an antifungal antibiotic to combat fungal infections**—S. K. Majumdar and S. K. Bose, Calcutta University.

63736. 15 April 1958: **A liquid-liquid extraction procedure for the separation of niobium-tantalum oxide mixtures**—B. Sharma, and J. Gupta, NCL.

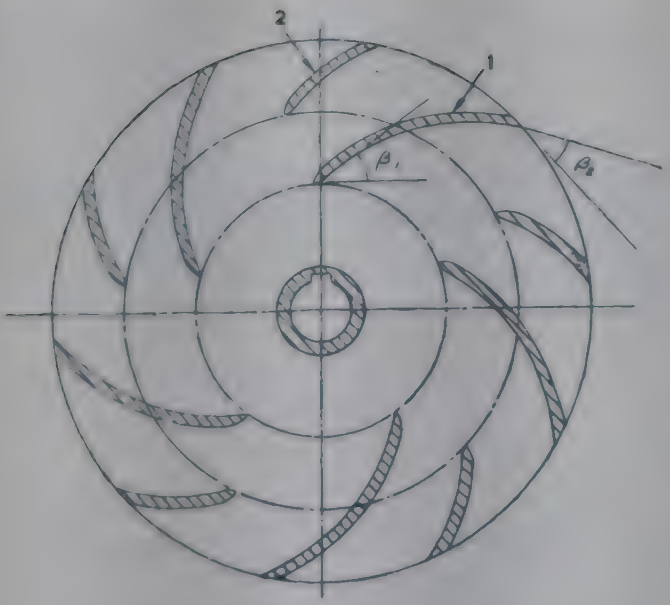
63865. 26 April 1958: **A tensioning screw jack**—G. S. Ramaswami and S. K. Narayana, CBRI [Group XXVI (1)].

Which is mounted on a reaction frame, a grip to hold wire or the like object or objects to be pulled.

63904. 30 April 1958: **A process for recovering zirconium dioxide from zircon**—P. B. Chakravarti and T. Banerjee, NML [Group III].

Sintered mass of zircon and potassium silicofluoride is leached to get a solution of potassium zirconium fluoride, the solution is thereafter subjected to electrolysis in a diaphragm cell followed by drying and ignition of the product of electrolysis.

64168. 23 May 1958: **Improvements in or relating to centrifugal pumps**—N. S. Govinda Rao, K. Seetharamiah and H. C. Radhakrishna, Indian Institute of Science [Group XLIV (1)].



Characterised in that (i) the impeller is fitted in a forced vortex casing and (ii) the vane outlet angle is less than the vane inlet angle.

64225. 28 May 1958 : **Low melting resistant glass compositions (addition to 56705)**—A Ram, S. Kumar and P. Nath, CGCRI [Group XXXVI].

Containing 5–12% R_2O_3 (Fe_2O_3 and Al_2O_3), 8–17% RO, 5–15% Na_2O, 0·12–5% K_2O, 0–3% B_2O_3, 0–0·8% F, 0–0·5 AB_2O_3, 0–0·5% Sb_2O_3, 0–5% TiO_2, 0·2% P_2O_3, 0–5% zirconium oxide, SiO_2 balance to make upto 100, where RO is CaO, MgO, ZnO, MnO, BaO, PbO.

64226. 29 May 1958 : **Preparation of predigested protein rich pastyp roducts for fortifying and seasoning food preparations**—V. Subrahmanyan, B. S. Lulla and D. S. Johar, CFTRI.

Void.

64352. 12 June 1958 : **A method for the extraction of diosgenin from dioscorea tubers**—V. Paul, K. L. Handa and I. C. Chopra, RRL, Jammu and Kashmir [Group IX(1)].

Digesting powdered dioscorea containing diosgenin tubers with 4–6 per cent boiling hydrochloric acid.

64353. 12 June 1958 : **Improvements in the manufacture of furan compounds**—R. T. Thampy, K. Kathpalia and V. R. Nagarajan, SRIFIR [Group IX(1)].

A process for the manufacture of furan compounds e.g., furfuryl alcohol, methyl faran or tetrahydrofurfuryl alcohol consists in reacting furfural with hydrogen in the presence of a catalyst consisting of oxides of copper and chromium on an inert carrier. The process is characterised in that the reaction of said organic compound with the said gas in presence of the catalyst is carried out in a fluidised bed. The hydrogenation is effected at a temperature of 120° to 150°C in contact with a supported catalyst comprising a carrier impregnated with oxides of copper and chromium stabilised with traces of oxides of alkaline earth metals. The ratio of furfural to hydrogen is between 1 : 15 to 1-50 by volume and the proportion of copper to chromium is 1 : 0·5 to 1 : 1·5 by weight.

64354. 12 June 1958 : **A process for the production of an enzyme product for use in leather manufacture as a depilant or for the preparation of bates**—S. Bose and S. C. Dhar, CLRI [Group XXIV(3)].

Mixing pulped animal pancreas and mold Asperigillus oryzae developed on culture of wheat flour $CaCl_2$ like metallic salts.

64366. 12 June 1958 : **Developments in or relating to the production of oils and fats having materials for detecting their adulteration and preservation against spoilage**—B. S. Joshi, NCL [Group XI(1)].

Comprising fatty material and alkylated dihydroxy diphenylmethane.

64457. 25 June 1958 : **A process for the manufacture of malted milk powder**—M. R. Chandrasekhara, M. N. Rao, M. Swaminathan, N. L. Lahiry, D. S. Bhatia and V. Subrahmanyan, CFTRI [Group XIV(5)].

Mixing concentrated malt extract with milk powder fat and carbohydrates and drying in vacuum driers.

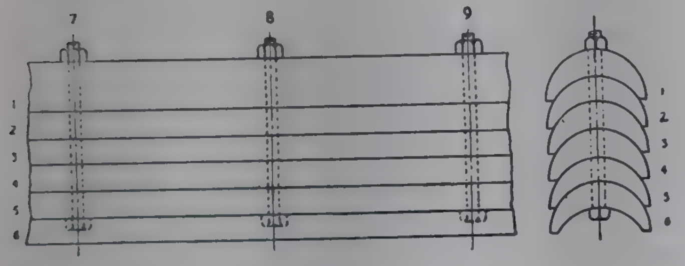
64458. 25 June 1958 : **A process for the manufacture of malted milk beverage flavoured with cocoa**—V. Subramanyan, M. R. Chandrasekhra, M. N. Rao, M. Swaminathan, N. L. Lahiry and D. S. Bhatia, CFTRI [Group XIV(2)].

Mixing milk powder with malt extract and flavouring with cocoa, caramel or the like and drying in a vacuum drier or under atmospheric presssure.

64523. 2 July 1958: **A process for the manufacture of water resistant briquettes from lignite and the like**—M. S. Iyengar, J. A. Subramanian and A. Lahiri, CFRI [Group XXXII(2)].

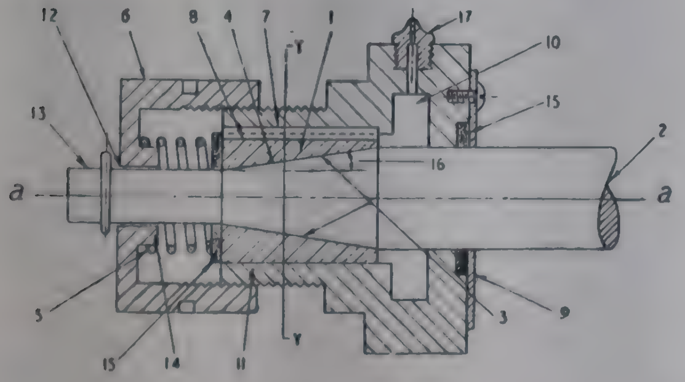
Heating lignite in finely powdered form for 2 to 3 hours, all temperature varying between 100°-400°C in the absence of air either in a static or fluidized bed and briquetting the resulting lignite.

64541. 4 July 1958: **A reinforced bamboo structure like springs or beams**—V. S. Goel, CRRI [Groups XXXVI (1) and LII(4)].



Relates to a method utilization of bamboo for a fabricated bamboo structure for use as springs or beams. The method consists in splitting a bamboo, removing the nodes, placing on top of one another a number of split bamboo sections 1—6 and clamping the bamboo sections 1—6 together by means of bolts and nuts 7, 8.

64554. 7 July 1958: **A bearing**—V. S. Goel, CRRI [Group LIV(1)].



In a bearing consisting of a non-rotating bush adapted to receive a shaft, the inner surface 3 of the bush I is made conical and is provided a correspondingly coned shaft 2 adapted to rotate within the said bush 1. The bush slides longitudinally under the thrust exerted by a spring 5 which is held in position and compressed by an adjusting nut 6. The bush 1 is prevented from rotating along with the shaft 2 by means of a key 7 and slot 8 arranged between the bush 1 and the casing 11 of the bearing.

64716. 21 July 1958: **Improvements in or relating to the manufacture of fireclay refractories**—Atma Ram, J. C. Banerjee and N. B. Chatterjee, CGCRI [Group XXV(1)].

Moulding or ramming a mixture of fire clay and grog made by calcining fireclay to which a mineraliser like Cr_2O_3 is added, and firing the bricks so make.

64956. 14 August 1958: **Preparation of predigested protein rich food powders**—B. S. Lulla, D. S. Johar and V. Subrahmanyana, CFTRI [Group XIV (5)].

A process for the preparation of predigested protein rich food powders suitable for infants and invalids consists in subjecting proteinaceous material of vegetable or animal origin to mould digestion (with moulds such as Aspergillus oryzae, Aspergillus flavus oryzae, Aspergillus flavus, Aspergillus niger).

The product will provide a rich source of essential amino-acids modified protein, vitamins and minerals.

Example

Soyabeans weighing ten pounds are soaked in running water for a period of 12-16 hours. The soaked beans are then removed from water and cooked in an autoclave for a period of 120 minutes at 15 lbs. pressure per sq. inch. The cooked material is then mixed with cracked parched wheat in the ratio of two parts of soyabeans to one part of wheat. The mixed material is then spread in shallow trays to a depth of about 2 inches, and the trays are inoculated with a mixed culture of moulds previously grown on cereal medium such as cooked rice or cooked wheat powder. The trays are then kept in the mold room and incubated at 24—30° for a period 2—7 days. During this period, the enmass get completely covered with green mold. The moldy mass is then suspended for a desired length of time in water containing 10—50% alcohol to effect autodigestion. The material is then repeatedly extracted with water till all the soluble matter is removed. The extract is boiled and then filtered. The clear extract is concentrated in a vacuum par till it reaches to 40—50% solids. The solvent is recovered at this stage. The concentrated extract is fortified with cocoa, vitamins, minerals sweetening and flavouring agents and finally dried in a vacuum drier. The dried product is sealed in tins or glass bottles of stored in a dry place.

64957. 14 August 1958: **A process for the preparation and isolation of gitalin and corresponding lanatoside from digitalis species**—N. M. Khanna, M. M. Dhar and M. L. Dhar, CDRI [Group IX(1)].

Fractionating glycosides of digitalis by chromatography over alumina.

64958. 14 August 1958: **Improvements in or relating to polishing compositions**—S. M. Shah, V. K. Hinge, V. V. Mhaskar and R. C. Shah, NCL [Group XLIII(4)].

Comprising mixture of sisal wax and bees wax or shellac in turpentine of white spirit or naphtha.

64959. 14 August 1958: **A process for the preparation of dihydrojasmone**—J. H. Amin and S. C. Bhattacharyya, NCL [Group IX(1)].

Dihydrojasmone is prepared by condensing octan-2-one of formula I with diethylsuccinate in the presence of potassium tertiary butoxide in tertiary butyl alcohol to give the half-ester of formula II, taclonising the half ester with HBr and acetic acid to give paraconic acid of formula III, decarboxylating this acid to a mixture of lactone IV and the unsaturated acid V, and finally cyclodehydrating the mixture with phosphorus pentoside and phosphoric acid to dihydrojasmone of formula VI.

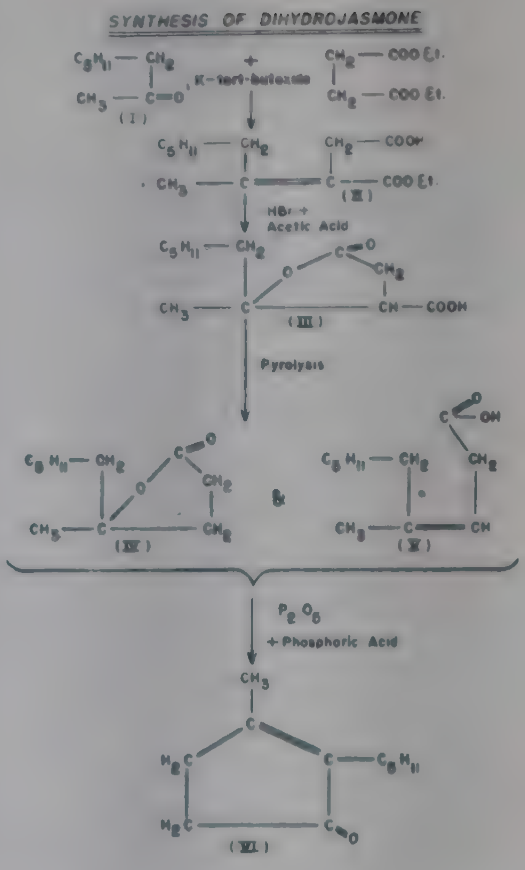


FIG. 1

65138. 3 September 1958: **Improvements in or relating to the manufacture of garlic powder**—J. S. Pruthi, G. Lal and V. Subrahmanyan, CFTRI [Groups XIV(5) and XIX(1)].

A process for the manufacture of garlic powder consists in subjecting garlic cloves to a mechanical treatment. The process is characterised in that the mechanical treatment comprises "flaking" (i.e. flattening of garlic cloves under mild pressure so that the cloves are still intact and not crushed) in an ordinary twin or triple roll mill prior to drying and powdering the cloves.

65230. 13 September 1958: **Improvements in or relating to hot-dip aluminising of steel**—S. M. Arora, P. K. Gupta and B.R. Nijhawan, NML [Groups XXXIII (9), XXXV and XLV(1)].

This invention relates to hot dip aluminising of ferrous materials. Here, boiled linseed oil is used as fluxing agent prior to hot dip aluminising.

65231. 13 September 1958: **An improved method for the production of chromium-manganese alloys by alumino thermic reaction**—R. A. Sharma and P. P. Bhatnagar, NML [Group XXXIII(1)].

A process for the production of chromium —manganese alloys by the alumino-thermic reactions, consists in the reduction of chromium and manganese ores or the chromium oxide and manganese dioxide with aluminium powder in a refractory lined vessel. The manganese dioxide acts as an energiser besides providing the required alloying constituent. Manganese and chrome ores are crushed preferably to pass 65 mesh B.S.S. sieve.

65282. 17 October 1958 : **Improvements in or relating to crease and shrink proofing of cellulosic textiles**—V. B. Chipalkatti, K. V. Ramalingam, N. B. Sattur and E. Syamalarao, SRIFIR [Groups IX(1), XXII(1) and XXIII].

Process for preparing a resin suitable for crease and shrink proofing of cellulosic textile materials consists in reacting methylol derivatives of acetylene diurea with carbohydrate ureide.

Example

53·25 gms. of acetylene diurea (prepared by reacting 2250 c.c. of 30% glyoal with 2175 gms of urea at 90°C for 2 to 3 hours and using HCl as a catalyst) is reacted with 135 c.c. of formaldehyde (33·3% by volume) in an alkaline *p*H during the course of ½ hour. To this is added an acidic solution of 66·6 gms of glucose ureide (prepared by fusing glucose and urea in 3 : 1 ratio in a stainless steel vessel for more than 6 hours at a temperature of less than 80°C and in the presence of H_2SO_4 as catalyst) in 30 c.c. of formaldehyde (33·3% by volume). The *p*H of the solution is adjusted at 5·6 and maintained for ½ hour. The solution is then neutralised by the addition of alkali and the *p*H adjusted again to 7 to 7·5. It is then bleached with animal charcoal at 50—60°C, cooled, and filtered and the filtrate is diluted to 60% solids content. The solution of thus obtained is lemon yellow in colour and is ready for textile application.

65283. 17 September 1958 : **A process for the preparation of palatable yeast hydrolysate powder from distillery sludge**—M. K. Rastogi and S. C. Agarwala, CDRI [Group IX(1)].

Consisting washing, autoclaving, enzymatic, hydrolysis, concentration and finally drying in vacuo to give rise to a light brown powder.

65440. 6 October 1958 : **A process for the extraction of wax from sisal waste**—S. M. Shah, V. K. Hinge, V. V. Mhaskar and R. C. Shah, NCL [Group XI(3)].

Separating the dry waste into "most Cuticle" part and the rest powdering the cuticle part, extracting powdered mass with hot organic solvents and obtaining wax therefrom by distillation.

65542. 17 October 1958 : **Improvements in or relating to the production of foundry core oil**—R. P. Varma, NCL.

65543. 17 October 1958 : **A process for the preparation of ω-dicarboxylic acids and ω-hydroxy acids suitable for conversion to macrocyclic compounds**—H. H. Mathur and S. C. Bhattacharyya, NCL, [Group IX(1)].

Aleuritic acid is brominated, esterified with methanol and then debrominated.

65556. 24 October 1958 : **A process for electrolytic production of iron-chromium alloys from chromite ore**—P. B. Chakravarti and T. Banerjee, NML [Group LVIII(5)].

Digesting chromite ore with sulphuric acid in presence of chromic acid and electrodepositing iron and chromium alloy from the resulting solution.

65610. 29 October 1958 : **Improvements in or relating to the production of chemically bonded metal clad or unclad basic refractories**—R. S. Mathur, and H. V. B. Rao, NML [Group XXV(1)].

Obtaining a mix by adding to crushed and dead burnt magnesite, a stable oxychloride cement, and pressing the mix into bricks of required shapes.

65611. 29 October 1958 : **A filter for calibrating the wave length scales of optical instruments such as the spectrophotometer**—Indra Sanghi and N. V. Parthasarathy, CECRI [Group XXXVIII (2)].

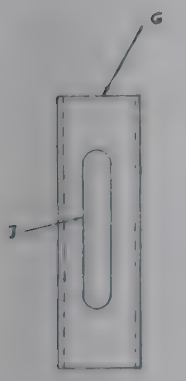


Fig II

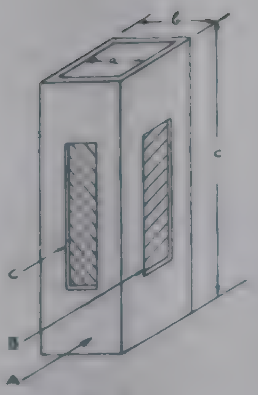


Fig I

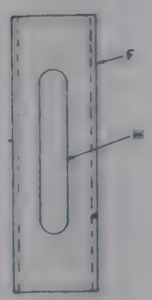


Fig III

Determining and plotting graphically transmission or absorption curves of coloured transparent materials by calibrated spectrophotometer, finding out points of intersection in the curve, choosing and pairing two coloured materials having one sharp and clear cut point of inter-section, and fixing selected pair of coloured materials in a frame or holder.

65646. 29 October 1958: **Improvements in or relating to the production of manganese metal from manganese chloride baths with special reference to the utilisation of low grade manganese ores**—V. Aravamuthan and S. Gopal, CECRI [Group LVIII(5)].

Electrolysing manganese-ammonium chloride solutions wherein sodium chloride is employed as anolyte with the production of chloride as valuable anode product.

65696. 3 November 1958: **Production of carbon pastes for use in the continuous soderberg electrodes**—P. Prabhakaram and H. P. Srinivasmurthy, NML [Group LVIII(1)].

Crushing dense carbon briquettes to obtain on aggregate and mixing the aggregate with a binder at a temperature in the range of 110°–145°C.

65777. 12 November 1958: **A new process for the production of 4-hydroxy carbostyrils**—V. R. Shah, J. L. Bose and R. C. Shah, NCL [Group IX(1)].

4-Hydroxy carbostyril, 3-substituted carbostyrils and analogous in which the aromatic ring contains one or more substituents are produced by reacting an aromatic amine compound having at least one ortho position free and malonic acid or an alkyl, aryl or aralkyl substituted malonic acid at temperatures between 50°–110°C in the presence of a phosphorous oxychloride and anhydrous zinc chloride.

65778. 12 November 1958: **Improvements in or relating to the production of transdiethylstilbestrol dimethylether and allied stilbenes**—C. G. Joshi, J. L. Bose and R. C. Shah, NCL [Group IX(1)].

Stilbenes are obtained by heating α α-dialkyl-α hydroxy-dihydro-stilbenes with phosphorous oxychloride without any solvent in a bath between 50° and 95°C from 5 to 15 mins.

By way of Example

15 parts of an isomeric mixture of 3 : 4-dimisylhexane-3·01 obtained from α-thyldeoxyanisoin by the application of gringuard reaction with ethyl magnesium bromide, is treated with 30 parts by volume of phosphorous oxychloride. The mixture is warmed on a bath maintained at 60°–65°C for 5 min. during which the substance goes into solution with a vigorous evolution of HCl gas and finally a solid material separates. The reaction mixture is cooled, triturated with cold water and the resulting solid is filtered washed with water and dried at 50° in vacuo. The trans-diethylstilbesterol dimethyl ether obtained in this manner melts at 120°C. The yield is 13·85 g. (98%). This product can be directly used, for demethylation to transdiethylstilbestrol with further purification.

65779. 12 November 1958: **A process for the production of hydrogen sulphide from gypsum**—Razia Osmani, D.S. Datar and S. H. Zaheer, RRL, Hyderabad [Group III].

Hydrogen sulphide is produced by reducing gypsum with coal or lignite or coke at 800°C or above and passing steam over calcium sulphite so formed at 600°C or above.

65780. 12 November 1958: **Improvements in or relating to evaporated metal coatings particularly suited for optical elements**—P. Hariharan, NPL [Group XXXIII(9)].

Semi-reflecting coatings comprise an evaporated film of a mixture of chromium and iron.

65890. 21 November 1958: **A method for the conversion of higher tar acids to lower phenols**—N. C. Saha, N. G. Basak and A. Lahiri, CFRI [Groups V and IX(1)].

A process for conversion of higher tar acids (boiling above xylenol range) obtained from carbonisation and hydrogenation of coal, lignite, peat or the like naturally ocurring vegetable decomposition products, to lower phenols (phenol and creosols) consists in catalytic hydrogenation in two stages namely, (i) catalytic hydrogenation (using ferric chromate on pumice catalyst), followed by (ii) catalytic hydrogenation using cobaltious oxide catalyst.

Example

I Stage: 100 grams of tar-acid of boiling range 100°–130°C at 10 mm. pressure is charged into an autoclave together with 34·2 gms. of water and 15 gms. of ferric chromate on pumice catalyst. Initial hydrogen pressure is 50 kg./sq. cm., temperature 400°C, time of reaction of 2½ hours. The yield of lower phenols boiling below 100°C, at 10 mm. of pressure is 52% more and amount of charge converted to neutral oils is about 6 %. Total loss of seed tar-acid as neutral oils and gaseous products is 15–30% by weight.

II Stage: 100 gms. of tar acids of boiling range 80°–100C° at 10 mm. of presssure obtained according to the first stage is charged in an autoclave with 20·5 gms. of water and 5 gms. of cobaltous oxide catalyst. Hydrogenolysis is carried out with an initial cold hydrogen pressure of 80 kg./sq. cm. at 400°C for about 5 hours. The yield of lower phenols boiling below 80°C at 10 mm. pressure (containing phenol and cresols) is 35% and there is no production of neutral oil. The unconverted material is recycled for further conversion.

65891. 21 November 1958: **A process for the conversion of coal tar or coal tar fractions to high speed diesel oil and gesoline**—S. K. Bose, N. G. Basak, A. Ganguly and A. Lahiri, CFRI [Groups V and XXXII(2)].

In a process for the catalytic hydrogenation of coal tar or coal tar fractions for obtaining more (about 60% to 70%) of high speed diesel oil and lesser (about 20–30%) amount of gasoline in the reaction products, the coal tar or coal tar fractions are subjected to hydrogenation in presence of catalyst consisting of a sulphide of the sixth group of periodic system or one or more oxides of the metals of the sixth group of periodic system at 300°–450°C and 100–200 atm. pressures, and wherein the oil space velocity is 0·5 c.c. to 1 c.c. of tar oil/c.c. of catalyst/hr. and hydrogen space velocity is 1000–1500 c.c. of H_2/c.c. of catalyst tar.

The tar or tar fraction is compressed to the reactor at the desired space velocity, pressure and temperature after heating through a preheater to 15°–20°C below the reaction temperature. This is then mixed with hydrogen gas. The oil and hydrogen gas stream enter the reactor, heated externally from top and pass through the bed of pelleted catalyst. The reaction product comes out from the bottom of the reactor through a needle valve and is cooled and condensate is collected in the pressure receiver. The tail gases, after scrubling of H_2S and NH_3, are metered and recycled. The condensate is depressurised at intervals and collected (e.g. by distillation) for subsequent treatment. The product obtained contains 20% to 30% low boiling oil in the gasoline range and 60–75% high speed diesel oil. The catalyst used, e.g. may be molybdenum sulphide or cobalt molybdenum, chromium oxide catalyst on kieselguhr.

65976. 1 December 1958: **Improvements in or relating to suspension polymerisation of vinyl monomers**—R. M. Joshi and S. L. Kapur, NCL [Group IX(1)].

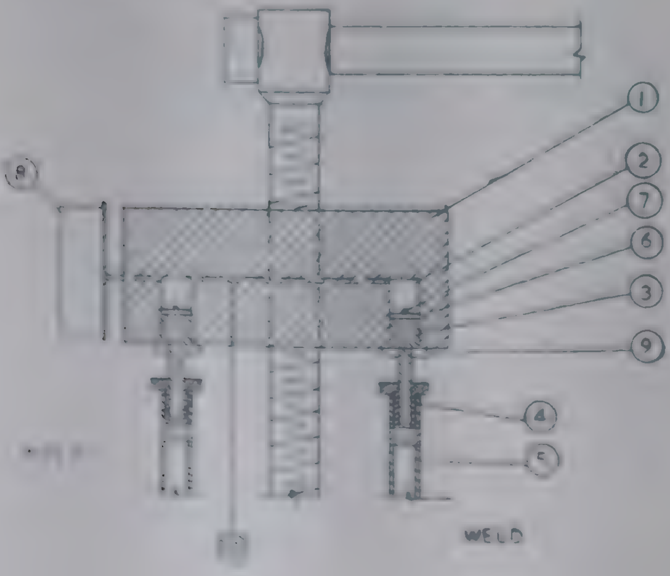
A process of suspension polymerisation of vinyl monomers for the production of granular polymer beads consists in heating a three-phase suspension [wherein the phases are i) the aqueous phase, ii) the monomer phase comprising a polymerisation initiator such as benzoyl peroxide, and iii) the solid phase consisting of a suspension stabilizer such as a) casein polyvinyl alcohol or bentonite, or b) inorganic precipitators such as calcium phosphate formed '*in-situ*'] at about 40°–150°C with stirring, till the monomer droplets polymerize; and is characterised in that an auxiliary suspending agent consisting of oxidised sugarcane wax, oxidation products of other natural waxes or higher homologues of fatty acids of chain length above 18°C is added in the monomer phase.

2400 parts of water and 4 parts of $CaCl_2$ (fused granular assay not less than 90% $CaCl_2$) are mixed and brought a temperature of 80°C in a circular kettle. 2500 parts of distilled styrene in which 2·5 parts of the oxidised sugarcane wax and 6·25 parts of benzoyl peroxide are dissolved, is added to the $CaCl_2$ solution in the kettle. The monomer is allowed to disperse into fine droplets by stirring for about 5 minutes. 100 parts of 5% aqueous solution of trisodium phosphate is then slowly added. The mixture is maintained at 80°C for 10 hours by stirring. After this period, the product is washed by acidifying with hydrochloric acid, drained, washed and dried. Clean uniform spherical heads of particle size between 0·1 and 0·5 and diameter are obtained.

65977. 1 December 1958: **Rubber-base adhesive**—Uma Shankar, NCL [Group XLII(1)].

Reacting liquid rubber with a mixture of phosphorus oxychloride and trichloride.

66079. 26 April 1958: **Improvement in or modification with particular reference to a pressure measuring device for recording the tension**—G. S. Ramaswami, S. K. Narayana and B. S. Bhatnagar, CBRI [Group XLI(6) and XLIX].



Relates to a tensioning screw jack as claimed in claim 1 of Indian Patent Specification No. 63865, wherein the device to measure the tension operates on the direct compression principle and records the tension in wires on a pressure gauge and comprises a cross-head 1 with two mutually connected cylindrical holes 2 in which are housed two pistons 3 which receive the load from the tensioned wires as a compression and transmit it to a common pressure gauge 8 by comprising the fluid contained in the holes. The piston 3 is attached to the legs of the frame, of a tensioning screw jack. A leak proof leather washer 6 is fixed to the head of the piston 3. A hydraulic connection 10 is provided between two cylindrical holes 2 mutually and a common connection is provided with the hydraulic gauge 8.

Indian Specification No. 61040 is also referred to.

66095. 10 December 1958: **A new method for production of diesel oil from coal tar and coal tar fractions**—N. G. Basak, S. K. Bose, A. Lahiri and A. Ganguly, CFRI [Group V].

In a process for the catalystic hydrogenation of coal tar or coal tar fractions for obtaining more (about 80—85%) of light diesel oil and lesser (about 10—14%) amount of gasoline in the reaction products coal tar or coal tar fraction collected at 200—300°C from carbonization of coal lignite, peat or the like naturally occurring product of vegetable origin is subjected to hydrogenation in presence of a complex catalyst consisting of binary or tertiary mixtures of nickel cobalt aluminium, chromium, or molybdenum as oxides or sulphides at 300—450°C and 10—75 atm. pressure.

66096. 11 December 1958: **A process for the production of bacterial diastase by submerged culture**—I. Babbar, R. M. Bakhi and M. C. Srinivasan, NCL [Group IX(1)].

Cultivating strains of Bacillus subtilis or Bacillus mesentericus in an aqueous nutrient medium.

66109. 11 December 1958: **Improvements in or relating to the production of magnesium metal**—V. Aravamuthan and K. Venugopal, CECRI [Group III].

Preparing anhydrous magnesium chloride in combination with alkali metal chlorides by reacting magnesite, dolomite obtained from sea or bitterns with ammonium chloride at 300°C to 750°C.

66148. 17 December 1958: **Improvements in or relating to lead dioxide semiconductors in the preparation of rectifiers**—H. V. Udupa, CECRI [Groups LVII(2), LVIII(5) and LXII].

In a process for the preparation of rectifiers by applying a counter-electrode on lead dioxide semiconductor, lead dioxide is electrolytically deposited on a metallic or graphite base or lead dioxide is electrolytically formed on lead metal. Lead dioxide required for the purpose is produced either by anodic deposition of same from a solution containing soluble salts of lead or by electrolytically forming the same by the anodic oxidation of metallic lead. The counter-electrode is applied on (electrodeposited and/or electrolytically formed) lead dioxide by keeping metal foils on the lead dioxide and pressing the same or by spraying metals on the lead dioxide.

66175. 19 December 1958: **A process for the oxidation of ortho, meta and para xylenes and mixed xylenes to the corresponding tolualdehydes**—H. V. Udupa and M. S. Venkatachalapathi, CECRI [Group IX(1)].

Oxidising xylene with manganic sulphate.

66194. 22 December 1958: **Improvements in or relating to can sealing composition**—R. Raghunath and S. L. Kapur, NCL [Group XII(1)].

Latex composition for can sealing comprising rubber latex stabilisers, proteinous matter, fillers, deordorising agent, defoaming agent, vulcanising ingredients, antioxidants and gums.

66195. 22 December 1958: **Preparation of lead dioxide electrodes for electrolysis**—H. V. K. Udupa and K. C. Narasimhan, CECRI [Group LVIII(5)].

Electrolytically depositing lead dioxide on graphite and/or carbon base is soulble lead salt baths.

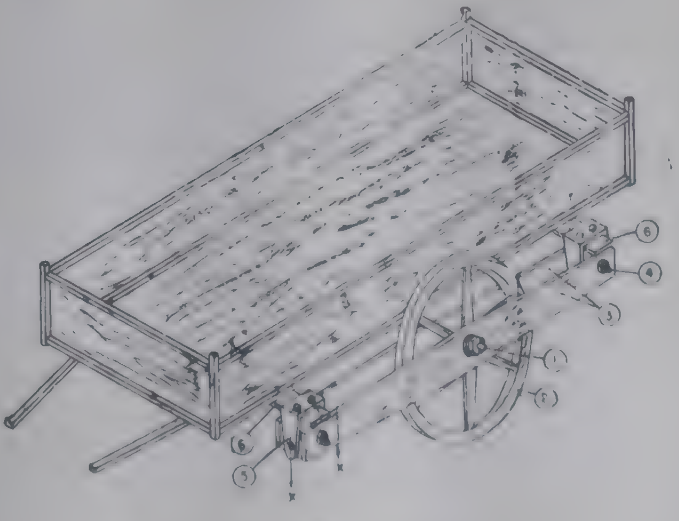
66196. 22 December 1958: **A process for the isolation of new cardiac glycosides from the seeds of Thevetia neriifolia Juss**—S. Rangaswami and E. V. Rao, Andhra University [Group IX(1)].

A process for the isolation of new cardiac glycosides consisting of peruvoside, ruvoside, neriifolia and cerberin from seeds of Thevetia neriifolia Juss consists in subjecting the fat-free powder of the seed to enzymic hydrolysis. The glycosides are extracted with solvents and chromatographed to separate the glycosides, peruvoside m.p. 164—168 and ruvoside, m.p. 228—230°, being obtained as crystals.

66197. 22 December 1958: **A new method for the oxidation of cumene to α-cumylhydroperoxide**—N. G. Basak, J. M. Sagar and A Lahiri, CFRI [Group IX(1)].

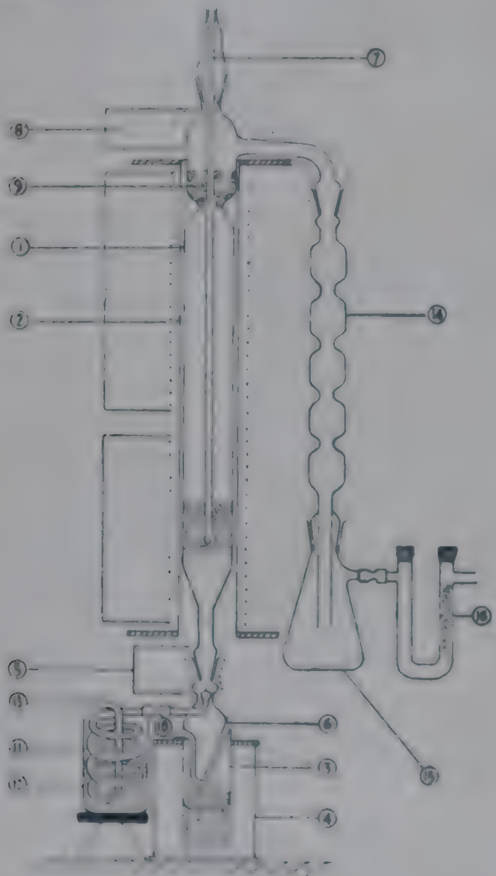
The invention provides a process for the production of α-cumylhydro-peroxide by oxidation of cumene by oxygen or air in presence of initiator, stabiliser and anti-inhibitor at a temperature of 110—140°C. The starting material cumene is given pre-treatment with equal volume of 5—20% concentration of alkali solution. In this process 1—4% of carbonates or bicarbonates of alkali metal are employed as stabiliser for α-cumyl-hydroperoxide formed during reaction. 0·2 to 0·8% of formaldehyde solution (35%) by weight of cumene and 1—3% of peroxides or hydroperoxides are used as anti-inhibitor and initiator respectively.

66228. 23 December 1958: **Improvements in or relating to wheel mounting mechanisms**—C. R. Gupta and S. R. Mehra, NPL [Group LII(3)].



Comprising a swivelling mechanism including two extensions or beams on each side of the vehicle frame work, and a wheel frame attached to the beams or extensions.

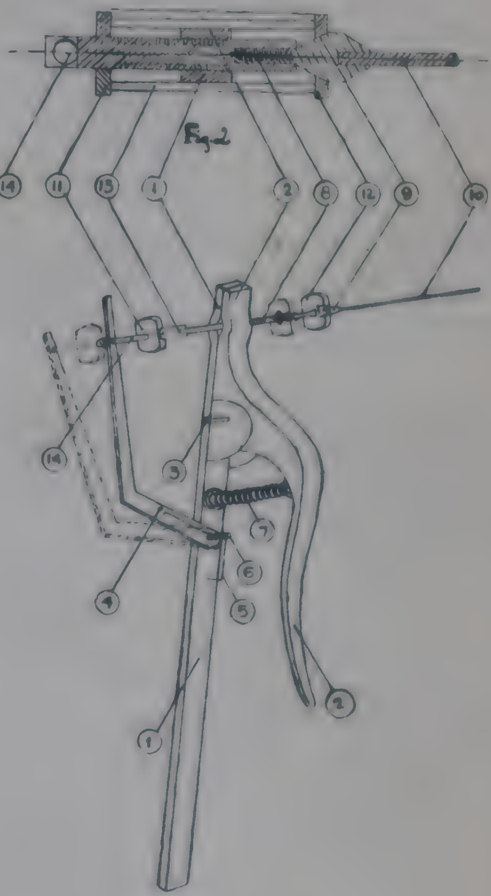
66293. 2 January 1959 : **A process for the production of anthraquinone**—C. S. B. Nair, A. N. Basu and A. Lahiri, CFRI [Group IX(1)].



Process for the maufacture of anthraquinone from anthracene consists in the oxidation of pure anthracene or of crude anthracene containing more than 10% of anthracenes by passing the vapours of feed mixed with an oxidising gas such as air over a fluidized bed of catalyst at a temeperature of 300–500°C. The catalyst may comprise 2–10% by wt. of vanadium pentoxide, up to 6% by wt. of ferric oxide, up to 3% of potassium sulphate and from 75–95% by wt. of silica.

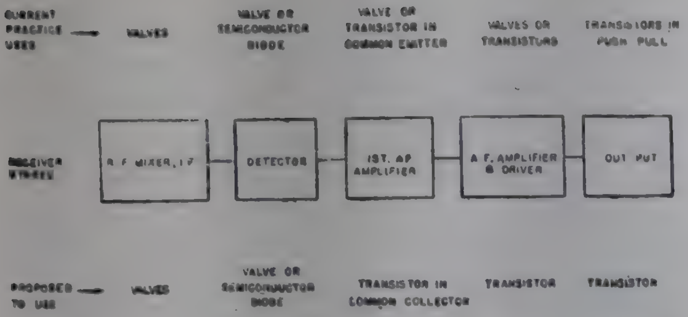
Apparatus for carrying out this process may comprise a vertical glass reactor (1) containing the catalyst bed (7) and placed inside an externally heated furnace (2), a carburetter (3) containing the material to be oxidised, a primary air inlet (10) to pass air through the molten material in the carburetter (3) also placed in an electric furnace (4) and carrying the vapour of the reacting materials into the reactor and an inlet for secondary air (13) to be blown in simultaneously into the reactor. The carburetter (3) is connected to the reactor (1) by means of a glass joint heated by a heating tape (5). The reaction product i.e., anthraquinone collects in the air cooled condenser (14) and settles in receiver (15).

66294. 2 January 1959 : **Improvements in or relating to electrode holders for manual arc welding**—G. S. Chowdhury, G. C. G. Reddy, M. K. Chary and S. H. Zaheer, RRL, Hyderabad.



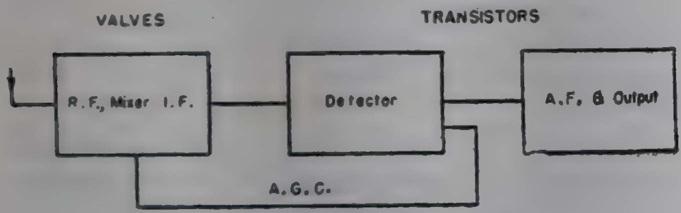
Comprising two jaws, a replaceable collet chuck for holding the electrode, a sliding member held between the two jaws and connected to the chuck, means being provided for actuating the chuck by opening and closing the jaws of the holder.

66295. 2 January 1959 : **Improvements in or relating to electronic receiving equipment using valves and transistors as linear circuit elements**—M. V. Joshi and T. V. Ramamurti, NPL.


CURRENT PRACTICE USES
VALVES
VALVE OR SEMICONDUCTOR DIODE
VALVE OR TRANSISTOR IN COMMON EMITTER
VALVES OR TRANSISTORS
TRANSISTORS IN PUSH PULL
RECEIVER STAGES
R.F. MIXER, I.F.
DETECTOR
1ST. AF AMPLIFIER
A.F. AMPLIFIER & DRIVER
OUT PUT
PROPOSED TO USE
VALVES
VALVE OR SEMICONDUCTOR DIODE
TRANSISTOR IN COMMON COLLECTOR
TRANSISTOR
TRANSISTOR

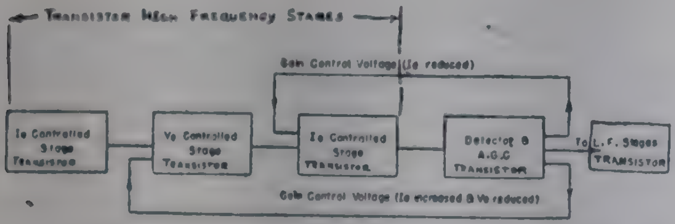
Provided with R.F. valves stages, A.F. transistor stages and a coupling stage comprising a transistor connected in the collector configuration.

66296. 2 January 1959: **Improvements in and relating to radio receiving equipment using valves and transistors**—M. V. Joshi and T. V. Ramamurti, NPL.


VALVES
TRANSISTORS
R.F., Mixer I.F.
Detector
A.F. & Output
A.G.C.

Valve stages working at signal and I.F. and transistor stages working at A.F. wherein the valve and transistor stages are interconnected by a transistor detector stage.

66297. 2 January 1959: **Improvements in or relating to transistorised receiving cquipment**—M. V. Joshi and T. V. Ramamurti, NPL.


Transistor High Frequency Stages
Gain Control Voltage (Ie reduced)
Ie Controlled Stage Transistor
Ve Controlled Stage Transistor
Ie Controlled Stage Transistor
Detector & A.G.C. Transistor
To L.F. Stages Transistor
Gain Control Voltage (Ie increased & Ve reduced)

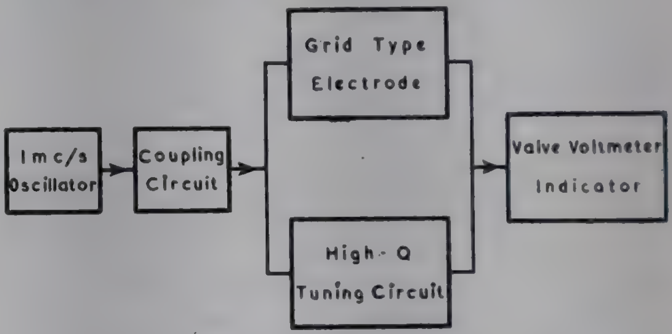
Consisting of transistor low frequency stages and transistorised high frequency stages, wherein gain control voltages are applied to the control stages of H.F. stages.

66298. 2 January 1959: **A new process for the manufacture of latex cement for leather**—G. S. Rama Iyer and Y. Nayudamma, CLRI.

A latex-cement (adhesive) for leather which consists of a mixture of natural rubber latex, casein, ammonia, formaldehyde and naphthalene leather browns. The rubber content is 3–10 times that of casein (dry weights).

A process for the preparation of an adhesive consists in thoroughly mixing natural rubber latex with a solution of casein in ammoniacal water followed by adding an aqueous solution of formaldehyde and naphthalene leather browns.

66670. 7 February 1959: **A device for the rapid classification of mica or like high frequency dielectrics on the basis of power factor**—S. S. Mandal and S. B. Roy, CGCRI [Group LVIII(6)].


1 mc/s Oscillator
Coupling Circuit
Grid Type Electrode
High-Q Tuning Circuit
Valve Voltmeter Indicator

A device for the rapid classification of mica or like high frequency dielectrics, comprises (i) an oscillator generating precisely a frequency of one mega cycle per second with good wave form and injecting through an inductive coupling circuit a very minute fraction of the output to (ii) a high-Q tuning circuit placed in parallel to (iii) a grid type electrode system using the test smaple as the dielectric and (iv) a valve voltmeter directly classifying a sample on the basis of its power factor.

Fig. 1 is a block schematic diagram illustrating an embodiment of the invented device.

66803. 21 February 1959: **Improvement in or relating to the manufacture of pressure sensitive adhesive tapes**—S. L. Kapur and B. R. Rao, NCL.

Comprising the application of two consecutive coats namely, an anchor coat and a 'sticky coat' on one side of a tape base, the anchor coat consisting of rubber latex, polyvinyl alcohol and a surface active agent.

66804. 21 February 1959: **A process for the conversion of peurvoside to ruvoside**—S. Rangaswami and E. V. Rao, Andhra University [Group IX (1)].

A process for the conversion of peruvoside to ruvoside comprises reducing peruvoside with a mild reducing agent such as aluminium amalgam.

Example

2 g. of the aluminium amalgam are added all at once to a solution of peruvoside (3g.) in 300 ml. of 95% alcohol. The mixture is shaken in a machine for 9 days, adding each day 0·5 g. of freshly prepared aluminium amalgam, 10—20 ml. of 95% alcohol and 1 ml. of water. On the tenth day, it is filtered through a thin bed of kieselguhr, the filter washed with alcohol and the solvents removed under vacuum. The residue (2·9 g.) is chromatographed over 90 g. of alumina using 300 ml. of solvents and solvent mixtures for elution. The chloroform methanol eluate is evaporated, the residue dissolved is a little methanol and diluted with ethers. Part of the solvent is evaporated off to give a saturated solution and on setting aside for 2-3 hours, ruvoside separated but washed with methanol-ether and finally with ether.

Indian Patent Application No. 66196 has been referred to.

66836. 25 February 1959 : **Manufacture of ethylene dichloride**—S. C. Banerjee, S. L. Phatak, M. U. Pai and L. K. Doraiswamy, NCL.

Bubbling gaseous ethylene and chlorine in a body of ethylene dichloride in a closed reactor.

66886. 2 March 1959 : **Improvements in or relating to bonding agent particularly suited for the manufacture of abrasive articles**—V. Nagarajan and R. T. Thampy, SRIFIR [Groups IX (i) and XLII (i)].

A process for the manufacture of improved bonding agents particularly suited for the manufacture of abrasive articles such as grinding wheels, sand papers, wheatstones or the like, consists in reacting (i) a resin containing a poly functional compound giving methylol group and (ii) a pre-condensate formed by reacting furfuryl alcohol with furfural.

In the example 1, to parts of a furfural furfuryl alcohol mixture are added a solution of H_2SO_4 in a reaction vessel for efficient stirring. The mixture is slowly heated and the external heating is stopped at 60°C. The condensation polymerization starts and the heat evolved raises the temperature. Water is added to reduce the speed of the reaction and also to prevent the temperature rising above 100°C. When the resin layer has attended the proper viscosity, large quantity of water is added suddenly to quench the reaction. The resin is separated washed with water and dehydrated, in vacuum, to provide anhydrous resin.

66953. 6 March 1959 : **Process for preparation of ethylene oxide**—H. Ibrahim, V. V. Deshpande and N. R. Kuloor, SRIFIR.

Passing ethyl alcohol with oxidising medium over dehydrating and oxidising catalyst at 150°—350°C.

66966. 9 March 1959 : **An improved process for the manufacture of porous rigid filters. (Addition to 59608)**— S. L. Kapur and R. N. Pandya, NCL.

A process for the production of porous rigid filters consists in coating the particles of an inert material with resinous adhesive composition comprising trimethylol phenol or dimethylol urea placing the coated particles in a mold with or without reinforcing supports and curing the said particles by heating the mold.

67262. 4 April 1959 : **Production of anion exchange material from coal**—J. N. Bhowmik, P. N. Mukherjee and A. Lahiri, CFRI [Group II(4)].

Method of producing anion-exchange material from coals consists in subjecting coal to the action of ethylene diamine at temperature varying from 180°—200°C.

67461. 24 April 1959 : **Process for the manufacture of carnallite from sea bittern**—K. Seshadri, G.D. Bhatt and C. J. Dave, CSMCRI.

By concentrating the sea-bittern by solar evaporation, extracting the mixed salt obtained by the liquor at hot, and cooling the extract obtained.

67468. 24 April 1959 : **Improvements in or relating to the preparation and isolation of isonicotins and nicotinic acids from the "beta-picoline cut"**—A. Lahiri, H. S. Rao, A. R. Panicker and G. N. Kulsrestha, CFRI [Group IX (i)].

A process for the production of isonicotinic and nicotinic acids by the direct oxidation of the beta-picoline cut yielding a mixture of pyridine carboxylic acids (isonicotinic, nicotinic and dipicolinic acids) is followed by separation of the individual pyridine carboxylic acids by extraction with rectified spirit and acetone-water mixtures.

67476. 25 April 1959 : **A process for the conversion of coal and lignite into smokeless fuel**—S. S. Choudhury, B. K. Mazumdar, S. K. Chakrabaratty and A. Lahiri, CFRI [Group XXXII(2)].

A process for the conversion of smoky coal or lignite into smokeless fuel by treating smoky coal or lignite with air or oxygen at 150°—350°C for a period of 6—10 hours is characterized in that the treatment is controlled to bring about selected dehydrogenation by oxidation thereby rendering the coal smokeless without essentially destroying the carbon structure.

67490. 28 April 1959 : **Improvements in or relating to the preparation of adhesive tapes (Addition to 66803)**—S. L. Kapoor and B. R. Rao, NCL.

Coated on one side is dried without any surface irregularities by passing over a freely rotated drum, sufficiently heated to completely dry before wounding.

67513. 29 April 1959 : **Improvements in or relating to the separation of niobium and tantalum from each other by liquid extraction**—S. L. Kapoor and B. R. Rao, NCL.

67568. 2 May 1959 : **A process for the preparation of aqueous solution of water insoluble furocoumarins**—J. Misra and B. Mukerji, CDRI.

Process for the preparation of aqueous solution of water-insoluable furocoumarins, consists in shaking the furocoumarin with an aqueous solution of an alkali salt of a fatty acid or a bile acid like cholic acid, deoxycholic acid, lithocholic acid and anthropodeoxycholic acid. A mixture of two or more furocoumarins may be dissolved in a mixture of two or more alkali salts of fatty acids or bile acids.

67572. 4 May 1959 : **Improvements in or relating to the production of smooth, hard anodic coatings on aluminium**—A. Joga Rao and B. Sambamurthy, CECRI.

67636. 11 May 1959 : **An improved process relating to thermal polymerization of unsaturated fatty acids**—B. G. Sharma and R. K. Bhatnagar, SRIFIR [Group **IX** (i)].

A process for the thermal polymerization of fatty acids at a temperature range of 250°—350°C in presence of water vapours, and in presence of oxidation catalysts capable of yielding free radicals such as perioxide or a persalt.

The polymerised fatty acids of this invention are suitable for the manufacture of alkyds, polyamides, polyester epoxy esters or the like.

67664. 13 May 1959 : **Separation of soluble silica from alkaline solution**—A. V. R. Rao, D. S. Datar & S. H. Zaheer, RRL, Hyderabad.

By passing CO_2 in alkaline solution of silica to decrease *p*H to 9.

67665. 13 May 1959 : **Improvements in or relating to the electrolysis of sodium sulphate solutions for the production of caustic soda and sulphuric acid**—V. Aravamuthan, CECRI.

67779. 23 May 1959 : **A process for briquetting of non-caking coal slacks and carbonisation of briquettes to produce a strong coke**—S. H. Zaheer, D. P. Agrawal, D. K. Rao & M. G. Krishna, RRL, Hyderabad.

Briquetting non-caking coal slacks and carbonising the briquettes after they are matured in a current of air or oxygen enriched air at elevated temperature.

67821. 27 May 1959 : **A process for the production of fungicides from coal**

tar—J. G. Saha, A. N. Basu and A. Lahiri, CFRI.

A process for the production of fungicides from low and high temperature tar-oil fractions boiling between 180°–360°C consists in chlorinating the said tar-oil fractions with dry chlorine gas in the presence or absence of a halogen carrier (example ferric chloride iodine, iron filings or aluminium amalgan) and a solvent (example carbon tetrachloride, glacial acetic acid, methyl alcohol or ethyl alcohol).

The fungicides of the invention are used in the preservation of industrial products like leather, wood, cotton-fabrics etc.

The reaction is carried out in a conventional reaction vessel of an alloy composition, provided with a stirrer and inlet and outlet tubes for bubbling chlorine gas and for the escape of hydrochloride acid respectively and a drain cock at the bottom of the vessel for draining off the product. The raw material crude tar oil fractions boiling in between 180°–360°C is diluted with a solvent (CCl_4), stirred and chlorine is bubbled for 6 hours. The product is drawn off, washed in another vessel with water and a dilute solution (10%) of alkali and the solvent and water are then distilled off.

67822. 27 May 1959 : **A process for the extraction of phenols from coal tar oil fractions or coal hydrogenation oils**—J. G. Saha, A. N. Basu and A. Lahiri, CFRI [Group IX(i)].

Process for the liquid-liquid extraction of phenols from coal tar oil fractions or coal hydrogenation oils, comprises using a saturated aqueous solution of urea as selective solvent at a temperature not exceeding 45°C. An anti-solvent like n-hexane or n-heptane may be added in proportion 50–100% by volume to the oil fractions before its treatment with aqueous urea solution. The solvent solution may be 50–200% by volume of the tar oil fraction and the phenols may be re-extracted therefrom with a polar solvent like di-isopropyl ether or diethyl ether or by diluting the extract with water and then by steam distillation.

67871. 1 June 1959 : **A method for the manufacture of porous bronze bearings**—S. Ranganathan, NML.

67931. 5 June 1959 : **A new flavouring substance from waste black pepper and common salt**—T. N. Ramachandra Rao, C. T. Dwarkanath and D. S. Johar, CFTRI [Group IXV(5)].

A process for the preparation of a new flavouring substance from waste black pepper and common salt consists in extracting waste black pepper with a solvent such as ethyl alcohol, ether, chloroform or benzene, removing the solvent to leave an oleoresin, treating the oleoresin with alkali to remove the resin and leave a precipitate containing the active bite and flavour principles of black pepper and spraying the alcoholic or like solvent solution of the precipitate on to a common salt and drying the sprayed mass to obtain the falvouring substance in powder form. As waste pepper, unfertilised buds, stems, deformed bessies are used. Preferably the oleoresin is treated with 5 to 15% alkali to remove the resin. The alcoholic solution is clarified by treating with decolourising charcoal, before being sprayed on the common salt.

67932. 5 June 1959 : **Improvements in or relating to the process of separation and isolation of the physiologically active principles of nim oil (Melia indica)**—C. Mitra, NCL.

By removing solvent from a solvent extract of the oil and extracting the semi solid mass obtained with petroleum ether.

68055. 17 June 1959 : **Improvements in or relating to complex mixtures of sulphides and polysulphides commonly known as oxidising salts**—O. P. Kulshreshtha and K. C. Srivastava, NPL [Groups III and XXXIII(9)].

Process for the preparation of complex mixture of sulphides and polysulphides commonly known as 'oxidising salts' particularly suited for decorative finish by colouring on copper, silver and alloys of these metals, comprises reacting sulphur with caustic soda and/or caustic potash. The reaction may be initiated by melting sulphur and adding a mixture of sodium and potassium hydroxide with stirring at 200–250°C. The oxidising salts are dissolved in water for use in colouring articles.

68171. 26 June 1959 : **Compositions and methods of making welding flux**—

M. R. Rao, N. V. Naidu and H. V. Bhaskar Rao, NML.

Grinding a mixture of oxides, hydrated oxides, carbonates, silica and silicates within the range of lime 22 to 35%, silica 34 to 54%, magnesia 5 to 15%, alumina 1 to 16%, iron oxide 0 to 1%, alkalies 0 to 1% and manganese oxide 0 to 5%, and melting the ground mix into a glass at 1,500°C in a glass melting furnace, quenching the glass and grinding the same.

68172. 26 June 1959: **A new process for the preparation of croton-aldehyde**—H. Ibrahim, V. N. Deshpande, N. R. Kuloor, SRIFIR.

By passing ethyl alcohol at 200–350°C over a catalyst comprising a dehydrating component and an oxidation component or a dehydrogenating component.

68173. 26 June 1959: **An improved process for the manufacture of ethylene dichloride**—Satish Chander, R. K. Bhatnagar and N. R. Kuloor, SRIFIR [Group IX(1)].

A process for the manufacture of ethylenedichloride by reacting ethlene and chlorine is characterised by carrying out the reaction under reduced pressure. A vacuum of 10·20 inches mercury column is maintained in the reactor. The reaction is carried out about 45°C.

Example

Through a cast iron reactor pacted with mild steel pipe cuttings steady stream of ethylene and chlorine were introduced separately at two points and simultaneously a stream of cold ethylene dichloride was showered from top of the reactor. Under these circumstances, ethyline and chlorine combined very rapidly and it was found that the vent gases coming out by the reactor hardly contained any free chlorine and similarly the ethylene dichloride collected also was devoid of dissolved chlorine. The ethylene dichloride from the bottom of the reactor was pumped to the top by a centrifugal pump through a pipe heat exchanger. The temperatures at the top and bottom of the reactor was kept at 35°C and 45°C respectively and the pressure was kept at 10–20 inches of mercury column. The vent gases coming out of the reactor were cooled by brine cooled condensers to liquefy vapours of ethylenedichloride. Then the vent gases were scrubbed with water that chlorine and hydrochloric acid were sucked and sent to storage. Overall yield of ethylenedichloride was 95% based upon the amount of chlorine and ethylene consumed.

Reference Indian Patent No. 51958, 56935.

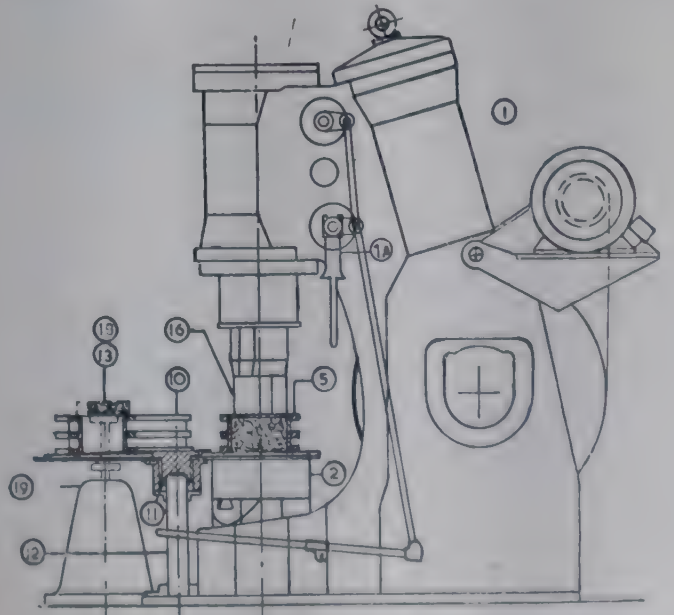
68174. 26 June 1959: **Refractory compositions containing non-refractory chrome ore and refractory products made therefrom**—M. R. Rao, N. V. Naidu and H. V. Bhaskar Rao, NML.

Comprises adding calcined or dead burnt magnesite and high grade chrome ore to non-refractory low grade chrome ores, then controlling the grain size of the mix and firing at suitable temperature.

68377. 13 July 1959: **Improvements in or relating to the protection of metallic surface against atmospheric corrosion**—K. S. Rajagopalan and G. Ramaseshan, CECRI.

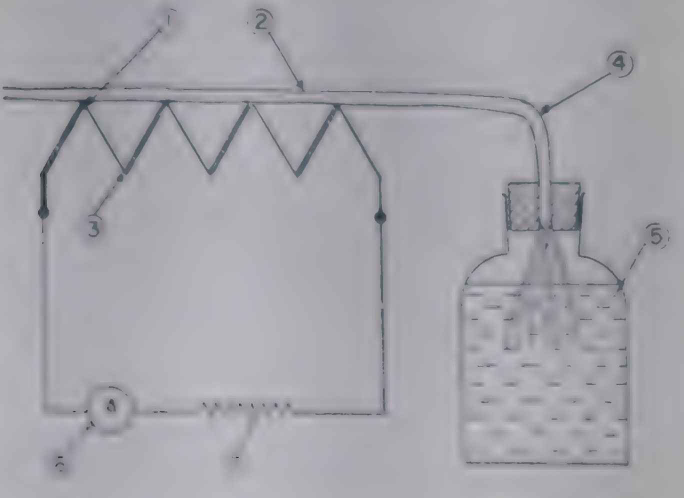
Protecting metallic surfaces against atmospheric corrosion by exposing them to an atmosphere containing vapours of m-dinitrobenzene or beta-naphthol.

68401. 15 July 1959: **A pneumatic or such other forge hammer adapted for the manufacture of bricks or blocks out of ceramic mixes**—H. V. Bhaskar Rao, H. P. Srinivasmurthy and R. C. Verma, NML.



A pneumatic or such other forge hammer having (i) a tup capable of dealing a series of blows on ceramic mixes of dry press consistency for the manufacture of dense bricks and blocks, (ii) a die for holding the mix, (iii) an anvil on which the die can be placed, (iv) a plate which can be placed over the mix and (v) an ejector for ejecting the brick from the die after the compaction. The sizes of the pneumatic and such other forge hammers utilised in a device claimed above may range from 100 lb.—400 lb. falling weight (in which the definition of "falling weight" is as given in Kents "Mechanical Engineers Hand Book" Eleventh Edition, pp. 9-11). In the device are provided three or more steel moulds or dies mounted on an automatic, intermittently moving turntable for bringing each mould in turn to the loading, compacting and ejecting position respectively. The switches are provided for switching the mechanism on and off manually or by suitable electronic or electro-magnetic relays. In the device instead of three moulds mounted on a turntable, a single mould is provided, which mould is mounted on parallel guides and can be pushed manually either to the compacting position under the tup of the hammer or over the ejection mechanism. A suitable operating lever, and a suitable relay control are provided for dealing a predetermined number of hammer tup blows on the mix contained in the mould. An ejection mechanism of hydraulic or mechanical type for ejecting the compact (the compact is brought in position over the said ejection mechanism either manually as in the case of single mould or by rotation of turntable mechanically) is also provided.

68611. 3 August 1959 : **A new device for generating electrical power from the atmosphere**—A. U. Momin, NCL.



Thermopile with one terminal maintained at a cool temperature by water evaporation and the other kept at atmospheric temperature.

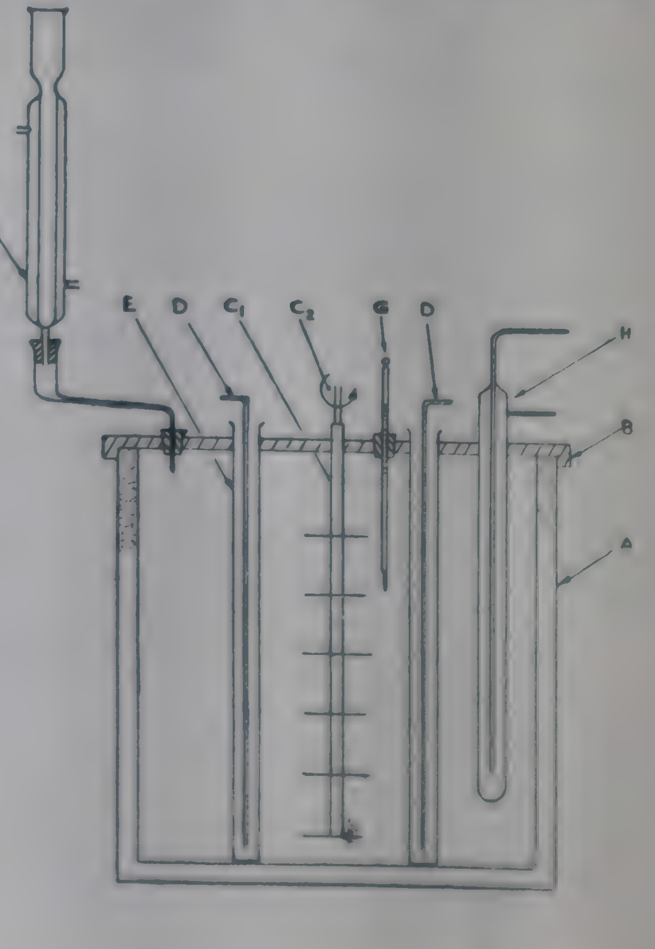
68680. 8 August 1959 : **Improvements in low temperature carbonisation practice as related to narrow continuous vertical retorts**—K. Y. Shrikhande, H. C. Chakrabarti, V. V. Rao, N. N. Das Gupta, S. Chatterjee and A. Lahiri, CFRI [Groups XXXII(1) and XXXII(3)].

A process carried out in a narrow continuous vertical retort at low temperature (below 800°C) is characterised in that an inert gas medium is circulated countercurrently through the down moving hot retort charge. Producer gas, water gas or coke-oven gas may be used as the inert gas.

An apparatus for carrying out the above process consists of a narrow continuous vertical retort provided with means comprising an inlet pipe for injecting the inert gas into the retort from the bottom thereof.

Coke, tar and gas are obtained as products.

68869. 27 August 1959: **Improvements in and relating to the manufacture of benzidine and substituted**



benzidines—H. V. Udupa, G. S. Subramanian and K. S. Udupa, CECRI.

By electrolytic reduction of nitrobenzenes using rotating cathode at a current density of 3—50 amps/dm^2 under alkaline conditions.

69062. 14 September 1959 : **Improvements in or relating to ferro-electric ceramic materials**—V. B. Tare, A. P. B. Sinha and A. B. Biswas, NCL.

Consisting of reaction product of lead metaniobate and barium metatitanate.

69164. 24 September 1959 : **An improved process for the manufacture of maleic anhydride**—B. S. Trehan, R. T. Thampy and N. R. Kuloor, SRIFIR.

Wherein the excess heat generated during the oxidation reaction is removed by using a moving bed reactor.

69165. 24 September 1959 : **A method of making binding material from blast furnace slag**—L. C. Jain and N. K. Patwardhan, CBRI.

Mixing together wet ground blast furnace slag with lime and sand.

69250. 3 October 1959 : **Improvements in or relating to the manufacture of abrasive articles**—V. Nagarajan and R. T. Thampy, SRIFIR.

Bonding the abrasive particles to a backing such as paper or moulding a mixture of abrasive particles and a bonding agent and then drying them, characterised in that the bonding agent used is as disclosed in patent No. 66886.

69325. 14 October 1959 : **A process for stabilisation of physostigmine (eserinum) sulphate**—M. B. Naidu and S. H. Zaheer, RRL, Hyderabad.

To aqueous physostigmine sulphate solution is added a solution of a compound containing methylene dioxy phenyl groups e.g. sesamin, sesamol, sesamoline, saffrol or piperonyl butoxide.

69369. 19 October 1959 : **A new bonding agent for the manufacture of abrasive articles, cast and moulded articles or the like**—V. Nagarajan, R. T. Thampy, SRIFIR.

69383. 19 October 1959 : **Refining of castor oil**—V. P. Harigopal, K. T. Achaya, S. A. Saletore and S. H. Zaheer, RRL, Hyderabad.

Raw castor oil is treated with excess of aqueous sodium carbonate and subsequently water-washed 3 to 4 times and bleached.

69410. 21 October 1959 : **Improvements in or relating to the use of castor oil in surface coatings (ricin varnishes)**—M. C. Menon, J. S. Aggarwal and S. H. Zaheer, RRL, Hyderabad.

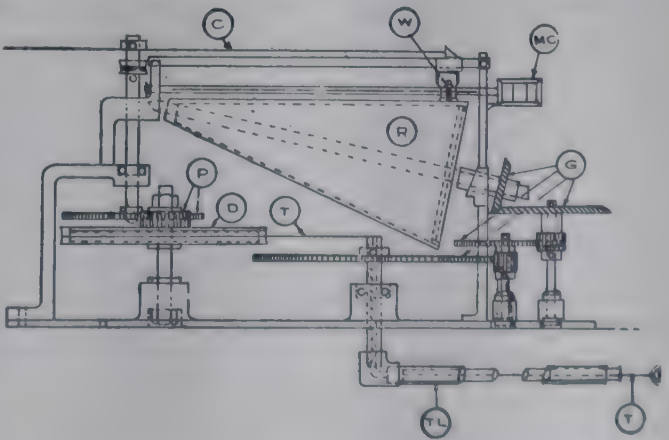
Castor oil is heated with rosin at 200—250°C for 4-5 hours, condensed with maleic anhydride, the product esterified with a polyol and dehydroxylated and bodied with $NaHSO_4$ at 250-280°C, cobalt and lead driers and white spirit being added.

69617. 9 November 1959 : **A process for the extraction of phenols from coaltar oil and aqueous liquors**—M. B. Roy, P. K. Banerjee, A. N. Basu and A. Lahiri, CFRI.

In two stages, first with organic basic solvent of amine or diamine type and then with solvent of greater solubility for phenol.

69618. 9 November 1959 : **Improvements in and or relating to the preparation of perchlorates using dioxide anodes**—H. V. Udupa and K. C. Narasimhan, CECRI.

69619. 9 November 1959 : **A mechanical area integrator for the measure ments of the cross-sectional area of mine road-way or the like**—Md. Shamsuzzoha, CMRS.



Comprises a flexible tracing cord, a cam which keeps a plywheel in a position, such that the number of rotations performed by it always bears a constant ratio in the area swept by the cord and a mechanical counter whereby numerical value of the area is obtained.

69620. 9 November 1959: **A process for the production of cellular rubbers and plastics**—R. G. Gokhale, and U. Shankar, NCL.

Using urea derivative RHN.CO.NH.NO_2, R being H or aryl as blowing agent.

69621. 9 November 1959: **Chlorinated alkyl-aryl phenols as pesticides**—B. C. Subba Rao and S. C. Sethi, NCL.

Chlorinating a raw material containing substituted phenols such as pentadecenyl phenol, pentadecenyl resorcinol, pentadecenyl catechol.

69690. 28 October 1959: **Improvements in or relating to paints**—Atma Ram, S. B. Roy and H. D. Sarkar, CGCRI.

Mica powder forms at least 10 per cent by weight of the anti-corrosive of the pigment.

69697. 16 November 1959: **Improvements in or relating to spin pasteurizers for canned acid foods**—J. S. Pruthi, P. K. Ramanathan and G. Lal, CFTRI.

Spin heating with steam a number of sealed food cans rotating on inclined endless belt within enclosed chamber.

69698. 16 November 1959: **A process for the manufacture of 2-methyl 3-ortho-tolyl 4 (3H) quinazolone and its salts**—S. H. Zaheer and I. K. Kacker, RRL, Hyderabad.

Reacting 2-methyl-3, 1, 4-benzoxazone with ortho toluidine triturating reaction product with cold dilute alcohol.

69780. 21 November 1959: **Improvements in or relating to production of citric acid from sugarcane molasses**—B. S. Lulla and S. H. Zaheer, RRL, Hdverabad.

Subjecting sugarcane molasses to mould growth using a strain of A. niger at 25–32°C and *p*H of 2–5.

69781. 21 November 1959: **Refining of cotton seed oil to light coloured products**—V. P. Harigopal, S. R. Rao, K. T. Achaya and S. H. Zaheer, RRL, Hyderabad.

Adding lower aliphatic alcohol to the oil.

69782. 21 November 1959: **Improvements in or relating to production of citric acid from saccharine materials**—B. S. Lulla and S. H. Zaheer, RRL, Hyderabad.

Fermenting sugar with low acid yielding strains of A. niger.

69919. 2 December 1959: **A method for the preparation of guanidino-ethyl phosphate**—(Mrs.) Radha Pant and S. S. Dubey, Allahabad University.

2-aminoethanol-1-phosphoric ester is reacted with S-methyl isothiourea.

69986. 9 December 1959: **Improvements in or relating to aluminium paints**—Atma Ram, S. B. Roy and H. D. Sarkar, CGCRI, Calcutta.

Containing at least 5% by weight of mica powder to aluminium.

70030. 12 December 1959: **A method of making light weight aggregate from Indian clays**—V. S. Ramachandran, N. C. Majumdar and N. K. Patwardhan, CBRI, Roorkee.

70049. 15 December 1959: **Manufacture of vegetable milk powder**—N. L. Lahiri, L. V. L. Sastry, S. R. Shurpalkar, M. R. Chandrashekhera, M. Swaminathan and V. Subramanyan, CFTRI, Mysore.

Drying homogenised blend of separately prepared milk emulsions of debittered soyabeans and defatted groundnuts.

70151. 23 December 1959: **Improvements in or relating to the utilization of oxidised coal**—A. K. Banerjee, P. N. Mukherjee and A. Lahiri, CFRI, Jealgora.

70169. 26 December 1959: **Improvements relating to the method of preparation of anhydrous magnesium chloride**—H. C. Gaur and W. K. Behl, Delhi University.

Heating hydrated magnesium ammonium chloride at 175±5°C and product at 300–350°C.

70170. 26 December 1959: **A new process for the prevention of formation of adherent scales on the bubble caps of alcohol rectifying columns**—S. Ramachandran and S. R. Rajagopalan, CECRI, Karaikudi.

70171. 26 December 1959: **A process for the isolation of levulinic acid in its preparation from carbohydrate materials, such as molasses**—C. N. Rao, C. C. Reddy, G. S. Sidhu, I. K. Kacker S. H. Zaheer, RRL, Hyderabad.

Using ketonic solvents as extraction solvents.

70172. 12 December 1959: **An Improved process for or relating to manufacture of lower vinyl esters in general and vinyl acetate in particular**—S. Ramanujam, R. K. Bhatnagar and N. R. Kuloor, SRIFIR, Delhi.

Reaching para aldehyde with acetic anhydride in presence of catalyst i.e., cationic resins absorbed in solid carrier.

70173. 26 December 1959: **Two wire anchorage grips**—G. S. Ramaswami and S. K. Narayana, CBRI, Roorkee.

70174. 26 December 1959: **An improved process for the production of dimeric linoleic acids**—S. Chandra and R. K. Bhatnagar, SRIFIR, Delhi.

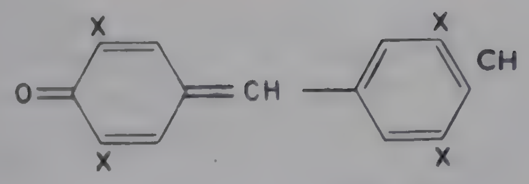
By heating hydroxy fatty acids contained in castor oil to a temperature of 200–450°C under a pressure 100-1200 lbs/sq. inch.

70175. 26 December 1959: **A method for the preparation of some 1, 2, 3, 4-tetrahydroquinolines**—G. Thyagarajan, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

A substituted carbostyril or 2, 3, 4-dihydrocarbostyril is reduced by a complex metal hydride.

70318. 8 January 1960: **Developments in or relating to the production of oils and fats having materials for detecting their adulteration**—B. S. Joshi, NCL.

Comprising a fatty oil and an alkylated methylene quinone.



(I) X = alkyl
(II) X = tert-butvl

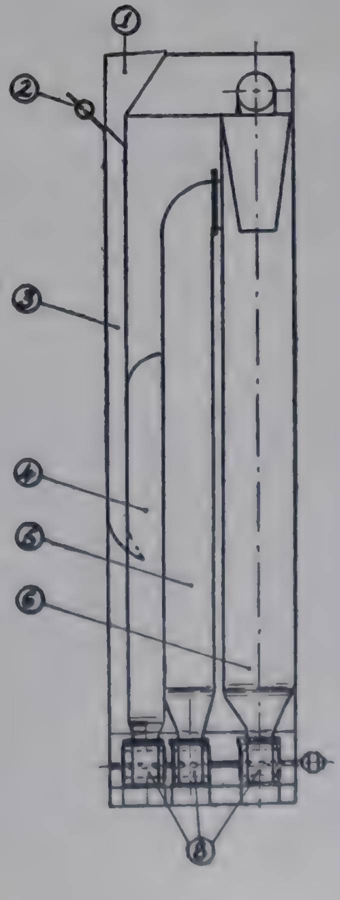
70319. 8 January 1960: **Improvement in or relating to the process of preparing N-methyl-taurine**—G. P. Thakar and B. C. Subha Rao, NCL, Poona.

Condensing reaction product obtained from aqueous ethylene chlorohydrin and sodium sulphite at 245°C and 100 atoms for 4 hours with aqueous methylamine in presence of caustic potash.

70479. 22 January 1960: **Preparation of a non-shrinking and low expanding cement**—Mohan Rai, S. K. Chopra and N. K. Patwardhan, CBRI, Roorkee.

Mechanically mixing Portland cement with 25 parts of an admixture comprising calcined kaoline, hydrated lime and gypsum in dry state.

70555. 29 January 1960: **An air separator**—Y. K. R. Rao, CFTRI, Mysore.



Comprises a feed pipe, a primary separating pipe, a supplementary separating pipe, a cyclone separator and a suction fan.

70670. 8 February 1960: **Improvement in or relating to the controlling of water evaporation for conserving water in lakes and reservoirs**—(Miss) S. B. Kulkarni, M. K. Gharpurey, Noshir R. Sanjana, A. V. Deo, K. O. Abraham and B. C. Subha Rao, NCL, Poona.

Condensing n-alkyl alcohols with ethylene oxide, propylene oxide, diethylene glycol or propane diol.

70889. 26 February 1960: **A process for the production of graft co-polymers from natural rubber**—C. C. Menon and S. L. Kapur, NCL, Poona.

Mixing vinyl monomer in natural rubber latex and using hydrazine hydrate as catalyst in presence of atmospheric oxygen.

71063. 14 March 1960: **Production of bacterial protease by submerged culture**—I. Babbar, V. K. Powar and V. Jagannathan, NCL, Poona.

Cultivating high protease producing strains of B. substilis and B. mesentericus by submerged culture with vigorous stirring in nutrient *aqueous media*.

71092. 17 March 1960: **A process for the manufacture of citric acid**—M. R. R. Raghavendra Rao and J. R. Vakil, NCL, Poona.

Extracting cotton leaf/stalk with water or dilute mineral acid and evaporating the extract.

71169. 22 March 1960: **Process for the manufacture of BB'-dichlorodiethyl ether**—N. R. Kuloor, Kanti Kathpalia and C. D. Anand, SRIFIR, Delhi.

Ethylene and chlorine is passed through an aqueous solution of ethylene chlorohydrin of at least 10 per cent strength and 0—15 per cent acidity.

71190. 24 March 1960: **Preparation of anion exchange resins**—N. R. Krishnaswami, K. P. Govindan and B. D. Dasare, NCL, Poona.

Reacting melamine with formalin and hexamethylene tetramine under acidic conditions heating reaction product to 120°—140°C for 10 hours.

71284. 31 March 1960: **Process for electrolytic engraving or etching on metals or alloys thereof**—K. C. Srivastava and O. P. Kulsreshtha, NPL, New Delhi.

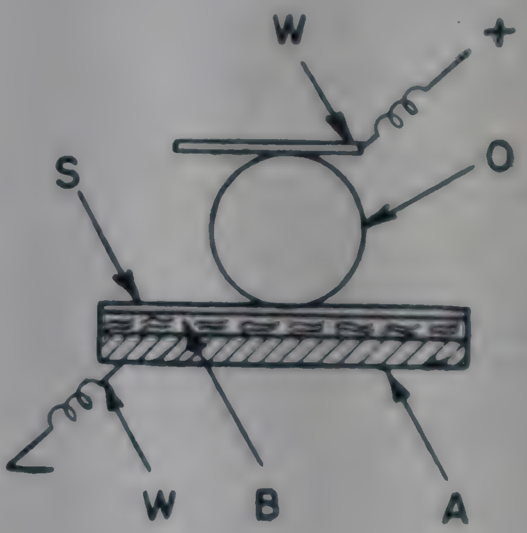


FIG. 1

Etching metal articles by passing electric current through an electrolyte soaked in a pad sandwiched between a stencil and a metal plate.

71285. 31 March 1960: **Improvements in the method for manufacture of acetaldehyde**—J. K. Mahendra, V. V. Deshpande and N. R. Kuloor, SRIFIR, Delhi.

Comprising catalytic dehydrogenation and/or oxidation of alcohol using a combination of a static bed of catalyst and a fluidized bed of catalyst material and/or inert material.

71301. 31 March 1960: **A process for preparation of cadmium sulphide**—K. N. Moorthy, Y. Venkateshan, D. S. Datar and S. H. Zaheer, RRL, Hyderabad.

71302. 31 March 1960: **Improvements in electronic wattmeters for measuring high and low power**—S. S. Banarjee and A. V. Bhattacharya, Banaras Hindu University.

Comprises valves to multiply current and voltage in a load with the help of resistances wherein are provided unbalanced plate resistances for matching the valves.

71321. 4 April 1960 : **Improvements in the process for the preparation of hydrazine compounds**—E. R. Saxena, D. S. Datar and S. H. Zaheer, RRL, Hyderabad.

By reacting liquor ammonia with sodium hypochlorite at 80°—100°C.

71322. 4 April 1960 : **A process for preparation of disinfectant grade creosote oil from primary tars**—D. P. Agrawal, M. G. Krishna and S. H. Zaheer, RRL, Hyderabad.

Heating tar oil mixed with alkali earth or alkali metal hydroxide to 200°C in presence of oxygen or distilling reaction product.

71333. 5 April 1960 : **Improvements in or relating to exterior house paints**—Atma Ram, S. B. Roy and S. D. Sarcar, CGCRI, Calcutta.

Incorporating mica powder along with pigments in an oil medium.

71467. 18 April 1960 : **Improvements in or relating to traffic paints**—Atma Ram, S. B. Roy and H. D. Sarcar, CGCRI, Calcutta.

Incorporating mica powder along with one or more conventional pigments like titanium dioxide, zinc, lithophone, lead chromate, carbon black in a solvent.

71702. 7 May 1960 : **A process for decolorisation of glass**—Atma Ram, S. K. Gupta and S. N. Prasad, CGCRI, Calcutta.

By melting glass mix containing decolorising ingredients comprising cerium dioxide, cobalt oxide and manganese dioxide.

71754. 12 May 1960 : **Surface active agents from cashewnut shell liquid**—S. C. Sethi, (Miss) S. B. Kulkarni and B. C. Subba Rao, NCL, Poona.

Sulphonating the phenolic constituents of cashewnut shell liquid at $-10°$ to $+50°$C.

71818. 16 May 1960 : **Improvements in or relating to the manufacture of sodium carboxy alkyl cellulose**—V. B. Chipalkatti, S. K. Manivannan and H. R. Chipalkatti, SRIFIR, Delhi.

Reacting cellulose alkali and etherifying agent using alcohol as slurry medium using a minimum of 5 : 1 alkali to cellulose molar ratio, 18—35% concentration of alkali to total water and molar ratio of etherifying agent to cellulose varying from 1·69 : 1 to 2·5 : 1.

71864. 20 May 1960 : **Improvements in or relating to the production of alpha-halotoluenes**—S. H. Zaheer, Baldev Singh, Bharat Bhushan, S. Iqbal Ahmed, I. K. Kacker, V. Krishnamoorthy and M. Zulfiqar Ahmed, RRL, Hyderabad.

71919. 25 May 1960 : **A universal fluid flow indicating manometer for flow indication in closed conduits**—R. K. K. R. Govindarajan, P.S.G. College, Coimbatore.

Treating reaction mixture of halogenation of toluene with a base and distilling.

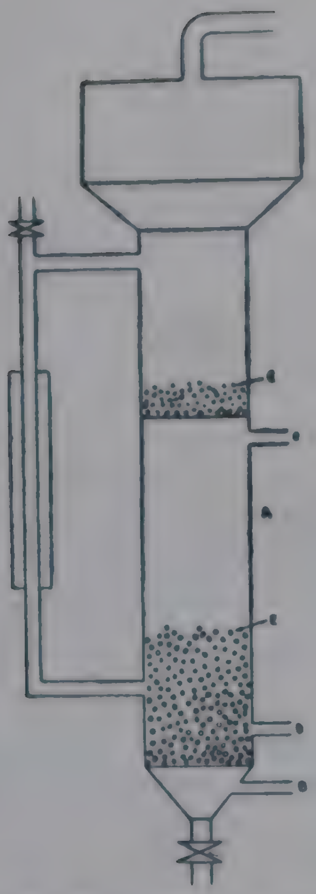
71944. 26 May 1960 : **Improvements in or relating to the manufacture of phenylacetic acid**—S. H. Zaheer, Baldev Singh, Bharat Bhushan, S. Iqbal Ahmed, I. K. Kacker, V. R. Krishnamoorthy and M. Z. Ahmed, RRL, Hyderabad.

Benzyl cyanide is gradually added to concentrated hydrochloric acid which is preheated at 51°—70°C.

71945. 26 May 1960 : **Long acting oestrogens and other physiologically active compounds from stilboesterol and formaldehyde**—M. M. Dhar and A. B. Kar, CDRI, Lucknow.

71946. 26 May 1960 : **Improvements in or relating to a process for the manufacture of ethylene chlorohydrin**—R. T. Thampy, N. R. Kuloor, (Mrs.) Kanti Kathpalia and C. D. Anand, SRIFIR, Delhi.

Passing ethylene and chlorine through water in which glass beads are fluidised while an alkaline solution is continuously run into the reactor.

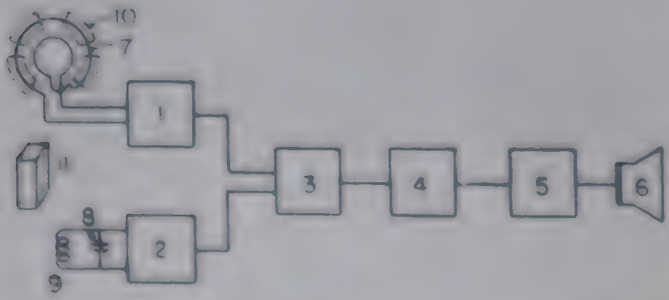


71978. 30 May 1960: **Improvements in and or relating to the electrolytic reduction of m-dinitrobenzene to 2:4 diaminophenol**—H. V. Udupa, G. S. Subramanian and K. S. Udupa, CECRI, Karaikudi.

71979. 30 May 1960: **An improved process for the manufacture of monoglycerides**—R. K. Kochhar and R. K. Bhatnagar, SRIFIR, Delhi.

By heating fatty oil and polyhydroxy alcohol in the presence of a catalyst consisting of an aqueous solution of carbon dioxide.

72264. 20 June 1960: **Metal detector**—C. S. Rangan and P. N. Taneja, NPL, New Delhi.



Comprises in combination a variable frequency operator, a fixed frequency oscillator, a heterodyne detector and an audio-frequency amplifier.

72407. 28 June 1960: **A process for the production of terpineol and terpin hydrate**—S. J. Hasan, Bharat Bhushan and S. H. Zaheer, RRL, Hyderabad.

Halomenthanes are reacted with a base dissolved or suspended in water, the reaction is then neutralised with acid and filtered to isolate the solid terpin hydrtate from the oily terpineol layer.

72408. 28 June 1960: **A process for the separation and isolation of the aromatic principles of Abelmoschus moschatus seeds**—G. Misra, V. N. Sharma, C. R. Mitra and K. N. Kaul, NBG, Lucknow.

Extracting aromatic principles of *Abelmoschus moschatus* seeds with alcoholic solvents.

72425. 30 June 1960: **A direct process for preparing the chlorides of barium and strontium from their sulphate minerals**—S. H. Iqbal, J. Lobo and J. Gupta, NCL, Poona.

Chlorinating sulphates in presence of carbon as reducing agent.

72444. 2 July 1960: **Antimony free white enamels**—Atma Ram and S. S. Verma, CGCRI Calcutta.

Comprising Na_2 and K_2O —5 to 30%, Fe—2 to 12% Silica—20 to 70%, Alumina —5 to 15%, Titanium oxide—5 to 25%.

72611. 20 July 1960: **Automatic collection of atmospheric pollen and spores**—P. K. K. Nair and K. N. Kaul, NBG, Lucknow.

72639. 21 July 1960: **A method of making yellow coloured bricks from alluvial soil**—L. C. Jain and P. C. Jain, CBRI, Roorkee.

From mixture of calcareous materials, sodium chloride and alluvial soil.

72851. 3 August 1960: **A modified process for preferential separation of the non-fatty constituents and simultaneous purification of the seed lipids**—Y. C. Awasthi, C. Mitra and K. N. Kaul, NBG, Lucknow.

Extracting oil/fat bearing seed/nuts with a water-miscible solvent or an admixture of water-miscible solvents with water.

72869. 4 August 1960: **Preparation of fatty acids**—C. C. Ninan, S. R. Rao and S. H. Zaheer, RRL, Hyderabad.

By treating crude fatty acids with solid boric acid.

73065. 20 August 1960 : **Improvements in or relating to the use of cashew-nut shell liquid in surface coatings**—M. A. Sivasamban, B. G. Murthy, J. S. Aggarwal, S. H. Zaheer and P. G. Sharma (NCL), RRL, Hyderabad.

Mixing 50-80% of cashew-nut shell liquid-formaldehyde condensate in white spirit with 50–20% of a medium or short oil oleoresinous varnish.

73066. 20 August 1960: **Preparation of road tar from primary tars**—B. S. Narayan Rao, R. Vaidyeswaran, D. P. Agrawal, M. Ehsan, M. G. Krishna and S. H. Zaheer, RRL, Hyderabad.

Blowing a gas containing oxygen at 100°–300°C in presence of a catalyst.

73067. 20 August 1960: **A process for the utilisation of Indian indigenous asbestos of amphibiole variety alone or in an admixture with chrysotile variety in the manufacture of asbestos cement sheets, and similar materials**—N. Biswas, S. N. Mukherjee, S. K. Majumdar, N. G. Banerjee, P. B. Dutta and A. Lahiri, CFRI, Jealgora.

Opening amphibole variety of asbestos fibres by treatment with a surface active agent.

73576. 3 October 1960: **A simple specific gravity indicator for use in heavy medium coal washing**—A. K. Chakravarti, A. G. Saha, P. Chatterjee, G. G. Sarkar and A. Lahiri, CFRI, Jealgora.

Comprises means for the supply of air into two tubes immersed in a liquid at two different levels, two bubblers for bubbling air through tubes and a narrow monometer tube or indicating the pressure differential.

73702. 13 October 1960 : **A process for the preparation of cyclopentadecanolide (exaltolide)**—V. V. Dhekne, B. B. Ghatge and S. C. Bhattacharyya.

Cyclizing hydroxypentadecanoic acid through thermal polymerization and subsequently depolymerizing the polymerized material under vacuum.

37730. 15 October 1960 : **A process for the preparation of urease from red gram (Cajanus cajan)**—R. Nath and T. K. Pradhan, School of Tropical Medicine, Calcutta.

A process for the preparation of urease which consists in adding acetone to an aqueous extract of red gram powder and separating the precipitate formed, followed by drying the acetone-free precipitate. The red gram powder is shaken with four times water below 31°C for 45 min. The aqueous extract is separated from the residue by settling 3·5 volumes of the acetone, cooled below 20°C are added to the aquoeus extract to precipitate the urease. The precipitate is dried over concentrated sulphuric acid for 48 hours under vacuum (74 cm.)

73978. 4 November 1960: **An improved rumbler for the extraction of essential oils from tight-skinned citrus fruits**—J. S. Pruthi, M. N. S. Vasudeva Rao, C. M. Parekh and G. Lal, CFTRI, Mysore.

Comprising a perforated vessel for holding citrus fruits moving abrasive rotary surface within the vessel and a water spray mechanism for spraying water on the fruits.

74184. 21 November 1960: **A new process for the manufacture of asbestos cement sheet tiles and similar materials having improved transverse strength using either chrysotile or amphibole variety of asbestos**—A. K. Chatterji, K. D. Dhariyal and N. K. Patwardhan.

74355. 5 December 1960 : **A process for refining cotton seed oil to obtain light coloured oil and soapstock**—P. L. Narayana Rao, K. T. Achaya and S. H. Zaheer, RRL, Hyderabad.

Heating with alkali lye containing 0·5–10 of 10–50% H_2O_2.

74356. 5 December 1960: **Preparation of insoluble reaction products of**

polystyrene for use as cation exchange materials—K. P. Govinda and N. R. Krishnaswamy, NCL, Poona.

Reacting polystyrene with conc H_2SO_4 and reacting the product obtained with formalin.

74450. 12 December 1960: **Improvements in or relating to the manufacture of maleic anhydride**—H. S. Trehan and R. T. Thampy, SRIFIR, Delhi.

Subjecting organic compound to catalytic oxidation in presence of catalyst consisting of molybdenum oxide and vanadium oxide on inert carrier bounded by means of an organic silicate binder.

74451. 12 December 1960: **Preparation of covering materials from anacardic materials**—D. Raghunath, N. P. Suryanarayana and N. K. Krishnaswamy, NCL, Poona.

Reacting cashew nut shell liquid with formalin and milling the gel obtained with natural or synthetic rubber.

74452. 12 December 1960: **Improvements in or relating to the production of tolylene-di-isocyanates**—S. R. Goel and R. T. Thampy, SRIFIR Delhi.

Process to prepare di-isocyanate by vapour phase phosgenation of the diamine in presence of a metallic sulphate or chloride catalyst impregnated on an inert carrier.

74596. 21 December 1960 : **A process for the production of middle distillates such as illuminating fuels (kerosene-substitutes), and diesel fuels from coal-tar and fraction thereof**—M. G. Krishna, R. Vaidyeshwaran, B. N. Rao, M. J. A. Khan and S. H. Zaheer, RRL, Hyderabad.

Extracting coal for fractions, before or after removal of tar acids and bases by organic solvents.

74680. 26 December 1960: **Improvements in or relating to electrolytic derusting of corroded metal parts**—K. S. Rajagopalan N. Subramanyam and Y. V. P. R. Row, CECRI, Karaikudi.

Using sea water as electrolyte; raising its temperature, making the article to be derusted alternately cathode and anode and passing a heavy D.C. current.

75407. 18 February 1961: **Improvement on Part No. 55816 relating to the process of desulphurising industrial gases**—S. C. Ghosh, S. C. Varshney, S. Banerjee, N. G. Basak and A. Lahiri, CFRI, Jealgora.

By passing the industrial gas through a fixed bed of iron oxide kept in a fluidized state having a moisture content 5—10% at temperature below 40°C.

75699. 13 March 1961: **Improvements in or relating to the conversion of total bile acids into lithocolic acid**—P. N. Rao, NCL, Poona.

Succinyling crude bile acid mixture, oxidizing total succinyl derivatives with Cr_2O_3 and hydrolysing and reducing the resulting ketone.

75820. 18 March 1961: **An improved profilograph (areameter) for the measurement of the cross-sectional area of mine-airways and for recording the shape of the same**—K. M. Kaiser, CMRS, Dhanbad.

Comprises a flexible tracing cord, a spring loaded drum, a capstan attached to the drum, a carriage with a marking point and measuring wheel and a circular supporting board.

76017. 30 March 1961: **Solvents and heat exchange liquids from cashewnut shell liquid**—S. C. Sethi, L. K. Doraiswamy and B. C. Subba Rao, NCL, Poona.

Etherifying phenolic components of CNSL group.

76018. 30 March 1961: **New hydrophobic cement**—S. K. Chopra and C. A. Taneja, CBRI, Roorkee.

Comprising ethyl oleate containing free oleic acid.

76414. 27 April 1961: **Improvements in the separation of silica from black alkaline liquor from paper mills**—A. V. Rajeswara Rao, Y. Venkateshan, D.

S. Datar, S. H. Zaheer and M. Mohiuddin, (Orient Paper Mills) RRL, Hyderabad.

Carbonising in two stages to *p*H 11 and then to *p*H 9.

76415. 27 April 1961 : **Improvements in or relating to the modification of aluminium base alloys containing silicon**—S. S. Bhatnagar, P. K. Gupte, B. R. Nijhawan and G. G. Nair, NML, Jamshedpur

Adding to molten aluminium base alloys containing silicon, a small quantity of the order of 0·05 per cent of sulphur as modifying agent.

76416. 27 April 1961 : **A process for the production of efficient fuel from lignite and anthracitic coals having high ash content**—D. K. Rao, D. P. Agrawal, K. S. Rao, M. G. Krishna and S. H. Zaheer, RRL, Hyderabad.

By mixing lignite or anthracite with one or more of the blending components, viz. charcoal, saw dust, coal, coke, tar, pitch or other fuel like materials.

76515. 3 May 1961 : **Improvements in or relating to the conversion of oil seeds to a material particularly suited for aqueous extraction of protein and oil**—V. Subrahmanyan, CFTRI, Mysore.

Flaking oilseeds e.g. in roller mill at ordinary temperature (25°C to 35°C).

76516. 3 May 1961 : **Improvements in or relating to the production or manufacture of protein and oil from groundnuts and other oil seeds**—V. Subrahmanyan, CFTRI, Mysore.

Nuts with optimum moisture content (8-12%) and flaked, agitated with alkaline water and fibrous matter filtered off on a wire mesh.

76517. 3 May 1961 : **Improvements in or relating to the production or manufacture of protein and oil from groundnuts and other oil seeds**—V. Subrahmanyan, CFTRI, Mysore.

The material is flaked and extracted with aqueous alkali and then the extract is centrifused to separate the oil fraction, and the sludge from the protein solution, the latter being acidified to precipitate protein.

76557. 6 May 1961 : **Process for synthesis of phenyl-tertiaryamin propionates and propanols**—R. S. Kapil, S. N. Mehra, N. M. Vohra, J. D. Kohli and Nitya Anand, CDRI, Lucknow.

By reacting secondary amine with phenylpropyl component capable of reacting with amine to form propionic acid or ester.

76681. 15 May 1961 (ante-dated to 26 December 1959): **Preparation of new series of organic compounds, viz., 1 (dialkylamino-alkyl) 1, 2, 3, 4-tetrahydroquinolines**—G. Thyagarajan, G. S. Sidhu, S. H. Zaheer, RRL, Hyderabad.

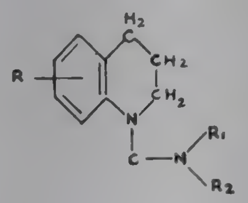


FIG. 2

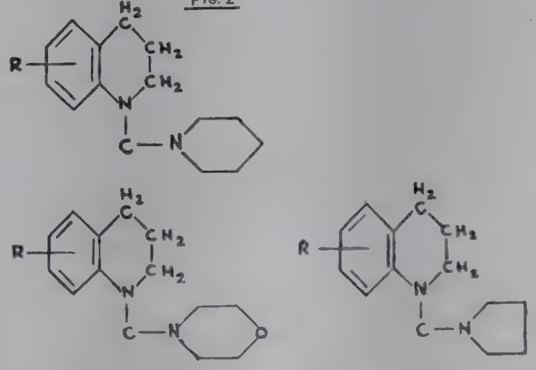
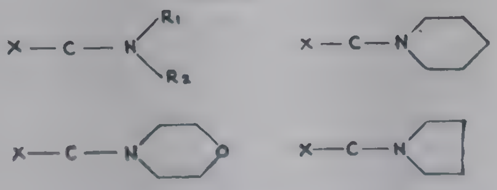


FIG. 3



Comprising heating a mixture of a 1, 2, 3, 4—tetrahydroquinoline with an alkylaminoalkyl halide or heterocyclic alkyl halide.

76682. 15 May 1961 : **A process for the recovery and purification of anthracene, carbazole and phenanthrene and allied chemicals from coal tar fractions in highly concentrated or pure**

state—D. K. Sen, C. S. B. Nair, A. N. Basu and A. Lahiri, CFRI, Jealgora.

Dissolving in lower aliphatic acid solvent for components other than anthracene i.e., formic, acetic or butyric acid.

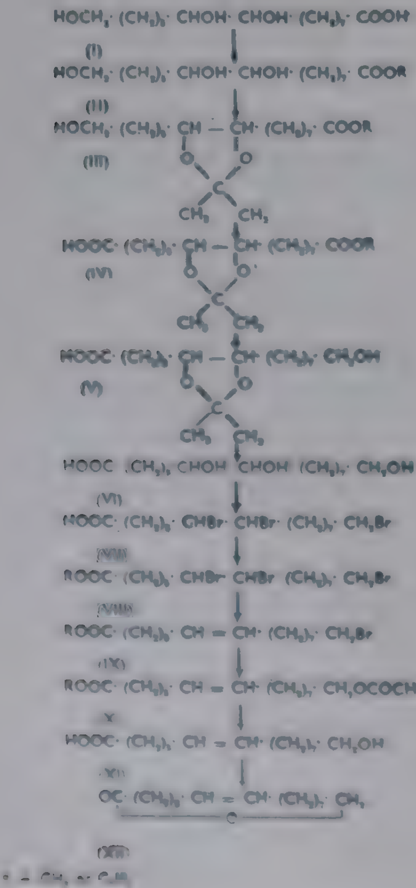
76683. 15 May 1961 : **Improvements in or techniques relating to filling of tubes**—G. D. Joglekar, D. Sen and S. K. Kapoor, NPL, New Delhi.

Feeding the powder in feeders placed on top of tubes and vibrating the tubes.

76997. 5 June 1961 : **Improvements in or relating to the production of copper powder by electrolytic process**—S. R. Ranganathan, NML, Jamshedpur.

Electrodeposition of copper from a solution of copper sulphate and sulphuric acid, the solution being treated with active principle or active principles derived from an organic substance.

77080. 9 June 1961 : **A process for the preparation of ambrettolide**—S. D. Subhis, H. H. Mathur and S. C. Bhattacharyya, NCL, Poona.

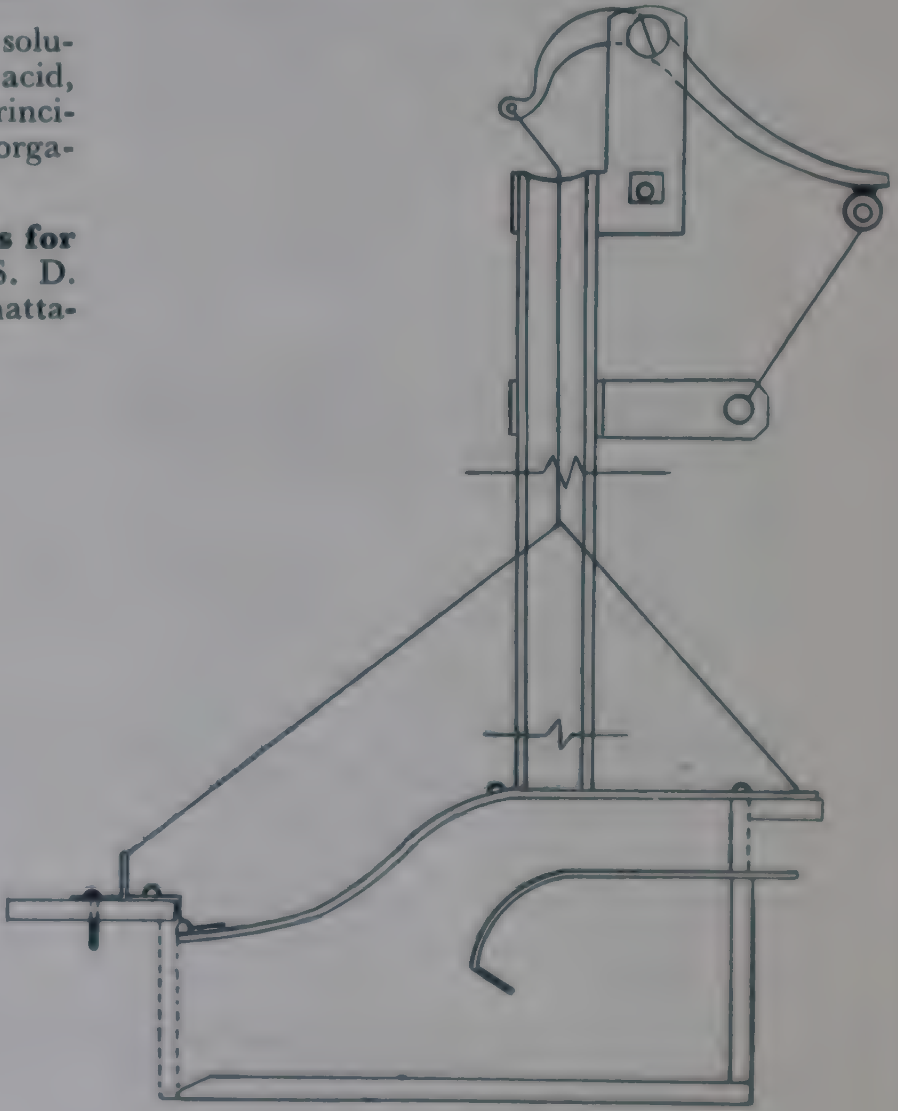


By thermal depolymerisation of ambrettolic acid polyester at 250–300°C and 0·1–1 mm in pressure of Hg.

77081. 9 June 1961 : **Improvements in or relating to the preparation of polyamide compounds and their compositions as anti-priming agents in steam generators**—K. D. Pathak and B. C. Subba Rao, NCL, Poona.

Condensing vegetable oils or high aliphatic carboxylic acids derived from vegetable oils with polyalkylene polyamides.

77223. 19 June 1961 : **Bed-load sampler**—H. L. Uppal, Irrigation & Power Research Institute, Amritsar.



Characterised in that the exit is at a higher level than the entrance and a deflector is provided for checking the bed load flow.

77224. 19 June 1961 : **Synthetic esters as speciality lubricants for low**

temperature performance and particularly for the lubrication of clocks and watches—K. D. Pathak and B. C. Subba Rao, NCL, Poona.

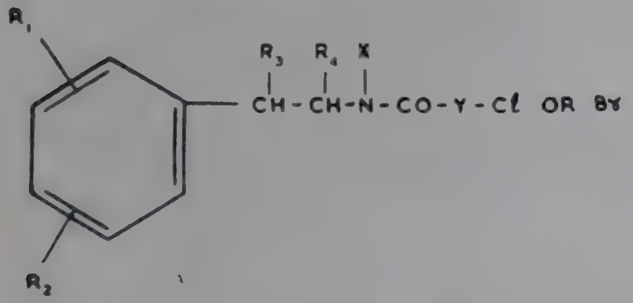
By brominating carboxylic acid followed by reaction with branched chain or straight chain aliphatic alkali metal alkoxides.

77225. 19 June 1961 : **A process for the preparation of beta ionone from pseudoionone**—B. N. Joshi, K. K. Chakravarti, S. C. Bhattacharyya and R. C. Shah, NCL, Poona.

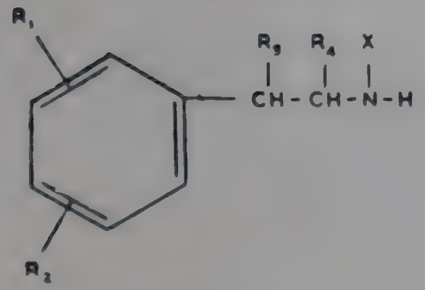
Cyclising pseudoionone in presence of a chlorinated hydrocarbon using sulphuric acid as cyclising agent.

77226. 19 June 1961 : **New N-haloacyl-2-phenyl-ethylamine derivatives**—P. B. Sattur, G. S. Sidhu, S. J. Hasan and S. H. Zaheer, RRL, Hyderabad.

FORMULA I



FORMULA II



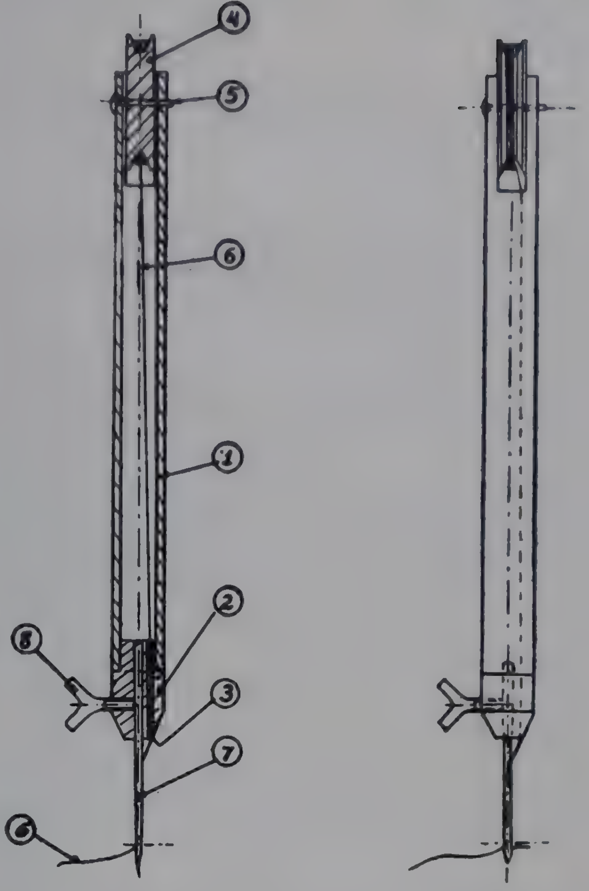
FORMULA III

Br OR Cl-CO-Y-Cl OR Br

Reacting 2-phenylethylamine with halocylhalide in dilute aqueous alkali at —5 to 10°C.

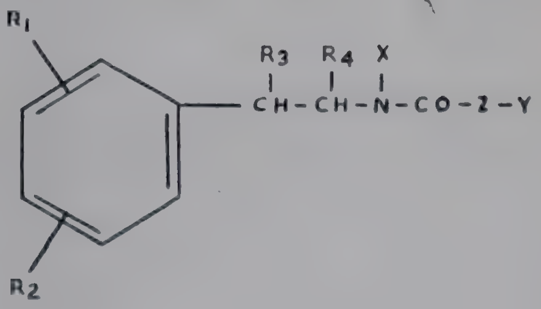
77449. 3 July 1961 : **A surgical suturing instrument**—A. P. Jayaraj, CFTRI, Mysore.

Comprising a handle fitted with a needle holder at one end, a thread wheel mounted on the other end for the thread to pass over and successively through the handle, needle holder and the needle.

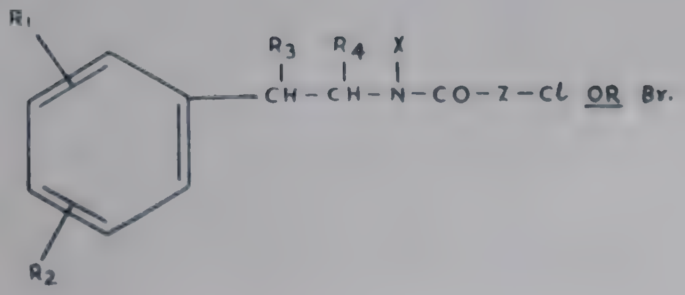


77450. 3 July 1961 : **N-aminoacyl b-phenylethylamines**—P. B. Sattur, G. S.

FORMULA I



FORMULA II



Sidhu, S. J. Hasan and S. H. Zaheer, RRL, Hyderabad.

Reacting N-haloacyl-(2)-phenylethylamine with secondary amine like diethylamine in presence of solvent.

77451. 3 July 1961: **Improvements in or relating to the production of terepineol**—Bharat Bhushan, N. K. Sogani and S. H. Zaheer, RRL, Hyderabad.

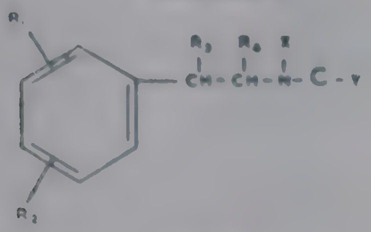
Treating terpin hydrate with a dehydrating agent in the presence of steam.

77452. 3 July 1961: **Improvements in or relating to the production of terpin hydrate**—Bharat Bhushan, N. K. Sogani and S. H. Zaheer, RRL, Hyderabad.

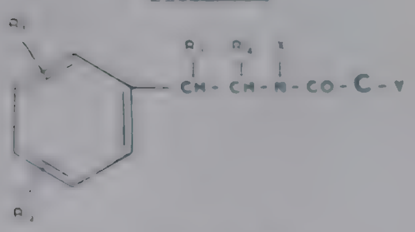
Wherein hydration is carried out in the presence of salts of silver, copper, zinc or cadmium.

77453. 3 July 1961: **N (alkylamino-alkyl)-2-phenylethylamines**—P. B. Sattur, G. S. Sidhu, S. J. Hasan and S. H. Zaheer, RRL, Hyderabad.

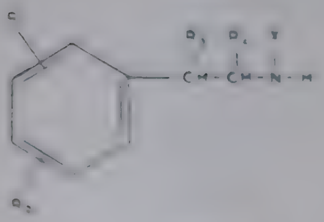
FORMULA I



FORMULA II



FORMULA III



FORMULA IV

Y-C-Cl OR [illegible]

Reducing suitably substituted heterocyclic amide with complex metal hydrides.

77713. 20 July 1961: **A process for the production of 5-keto-D-gluconic acid**—I. J Babbar, M. C. Srinivasan, M. G. Vartak and V. Jagannathan, NCL, Poona.

Growing *Acetobactor suboxydans* in aqueous medium containing cane molasses and corn steep liquor with agitation at 20—40°C.

78015. 10 August 1961: **Process for the extraction of tar acids**—D. K. Sen, C. S. B. Nair, A. N. Basu and A. Lahiri, CFRI, Jealgora.

Extracting crude tar oils with aliphatic acids.

78016. 10 August 1961: **Improvements in the production of thermo-setting resins**—R. T. Thampy and M. Krishnan, SRIFIR, Delhi.

Mixing together a monomeric ester of a saturated dicarboxylic acid, an ester of a dicarboxylic acid having a reactive double bond and an esterification catalyst and heating the mixture till a polyester is obtained.

78216. 25 August 1961: **A process for the production of 3-pentadecyl cyclohexanol from cashew nut shell liquid**—S. C. Sethi, D. D. Nanavati and B. C. S. Rao, NCL, Poona.

Catalytically hydrogenating anacardol at 175-250°C and pressure 200—1000 p.s.i. in presence of nickel.

78389. 7 September 1961: **A process for the manufacture of briquettes and moulded shapes from slack coal, coke breeze and fine metallic ores mixed with coke breeze**—N. Biswas, T. V. Subramanian, M. S. Iyengar and A. Lahiri, CFRI, Jealgora.

Briquetting a mixture of industrial fuel wastes and a basic inorganic binder, the fuel wastes being used in a size below 1″ without recrushing them, in moulds by ramming and curing the briquettes in water.

78418. 11 September 1961: **Preparation of barium sodium chromate and barium potassium chromate**—Razia Farooqi, D. S. Datar and S. H. Zaheer, RRL, Hyderabad.

Reacting barium chloride in aqueous solution with equimolar proportion of sodium dichromate or potassium dichromate.

78778. 7 October 1961 : **A method of making chocolate coloured bricks from alluvial soils**—L. C. Jain, P. C. Jain and E. S. Hira Lal, CBRI, Roorkee.

Consists in adding manganese ore to alluvial soils and making bricks.

78779. 7 October 1961 : **Formation of lustrous film on glass**—Atma Ram, S. N. Prasad, K. P. Srivastava and V. K. Vaish, CGCRI, Calcutta.

Formation of lustrous film on glass by incorporating copper oxide in a glass batch, melting the batch in a furnace, fabricating the glass article from molten glass and developing lustrous film by slowly cooling the glass article freshly fabricated and heat treating in the range of 400—600°C.

78780. 7 October 1961 : **An improved process for the preparation of carbon monoxide detector tubes**—A. K. Ghosh, D. P. Rajwar and B. Baksi, CMRS, Dhanbad.

Determining the suitability of the silica gel to be used by colorimetric method.

79075. 28 October 1961 : **Improvements in or relating to the two stage electrochemical production of dialdehyde starch**—H. V. Udupa, M. S. Venkatachalapathy and R. Ramaswamy, CLCRI, Karaikudi.

Wherein electrolytic oxidation of iodic acid is carried out in a cell having as anode lead deposited with lead dioxide and cathodes wrapped with asbestos cloth or rope or nylon cloth.

79107. 31 October 1961 : **A method for the preparation of glucose cycloacetoacetate hydrolysate (GCAH)**—M. C. Nath, J. M. Khanade and E. P. M. Bhattathiry, Nagpur University.

Comprises hydrolyzing glucose cycloacetoacetate with 2N.HCl, removing the resinous product by extraction with ether and freeing the aqueous solution thus obtained from the acid by repeated dilution with water and concentration in vacuum.

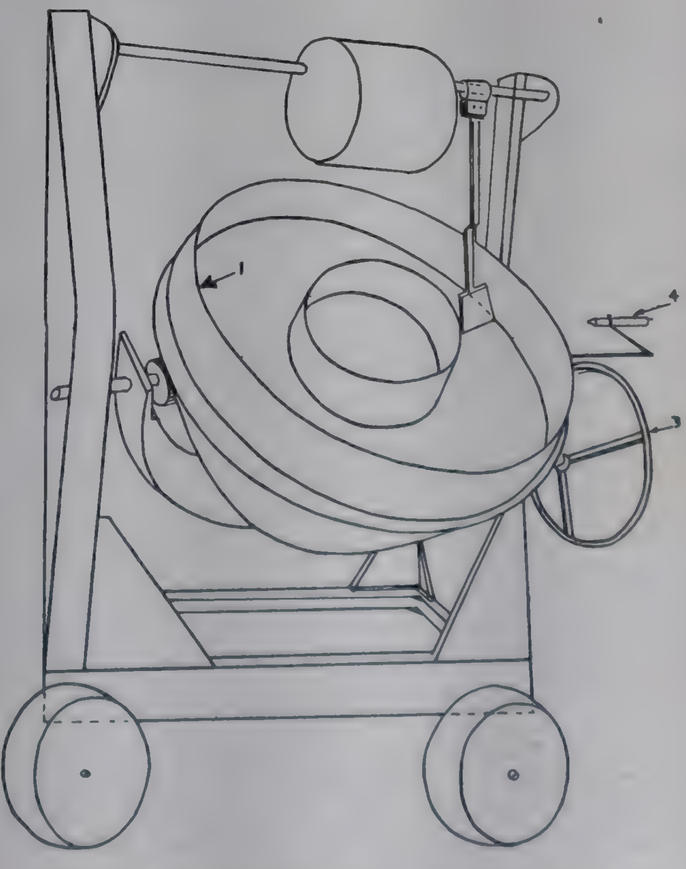
79211. 6 November 1961 : **A method for the production of superior grade of (smoke points above 20 mm) kerosine and aviation turbine fuels from high aromatic content (per cent) about 40 middle distillates of crude oil**—S. K. Bose, A. K. Ganguli, A. N. Basu, N. G. Basak and A. Lahiri, CFRI, Jealgora.

By catalytic hydrogenation with sulphides of one or more metals of group VI of Periodic System and at 750—3000 lbs./sq. in. pressure and 30—400°C.

79212. 6 November 1961 : **Improvements in and or relating to the electrolytic reduction of m-dinitrobenzene to 2 : 4 diaminophenol**—H. V. Udupa, G. S. Subramanian and K. S. Udupa, CECRI, Karaikudi.

By subjecting m-dinitrobenzene to reduction at an amalgamated cathode followed by reduction at a copper cathode.

79388. 20 November 1961 : **A process for the manufacture of bloated clay aggregate designed by us as "Gaylite" from the silt deposited by the river Hoogly**—S. K. Chopra and Kishan Lal, CBRI, Roorkee.

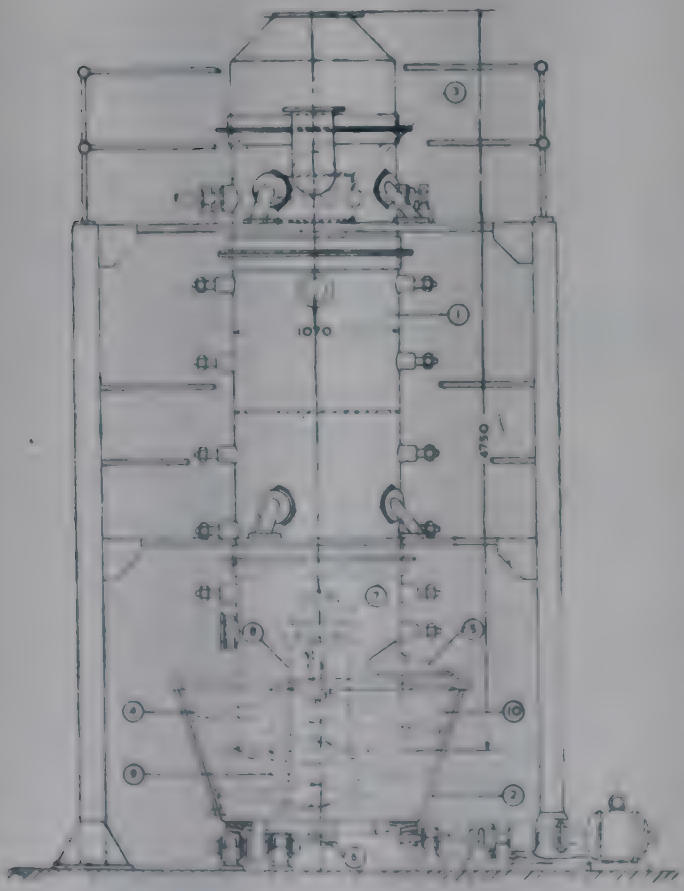


Preparing bloated clay aggregate from silt deposited from river Hooghly by crushing, modulizing the silt into spherical pellets and firing in rotary kiln.

79596. 1 December 1961 : **A process for the preparation of calcium based water soluble or dispersible proteins**—M. Srinivasan, CFTRI, Mysore.

Adding calcium hydroxide solution dissolved in acqueous sucrose solution to protein in ammonia.

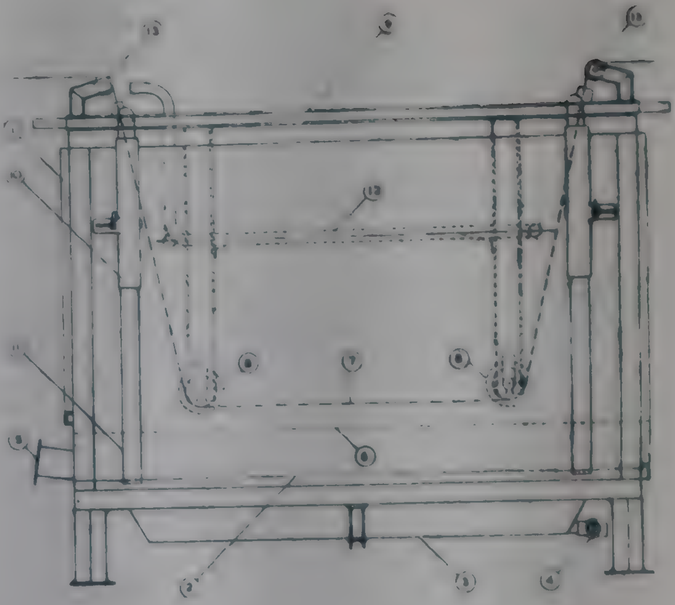
79597. 1 December 1961 : **Improvements in a continuous vertical counter current solids gas reactor**—M. J. Shahni, NML, Jamshedpur.



Comprising vertical stationary shaft dipping into rotating conical water-seal trough having gas distributor pedestal provided with a down conveying spiral.

* **79598.** 1 December 1961 : **An improved device for the continuous vapour phase degreasing of metallic wire and strip**—M. J. Shahni, NML, Jamshedpur.

Comprising a vessel the metal surfaces of which are exposed to vapours of a solvent, guide rollers being provided to guide the strip or wire through vapour zone.



79882. 20 December 1961 : **Improvements in or relating to the processing of textiles for imparting abrasion resistance and wash and wear characteristics**—R. M. Desai, J. Varghese and J. C. Patel, SRIFIR, Delhi.

Consists in reacting textiles with etherifying agents consisting of esters of 1 : 3-dichloro-propanol-2-in presence of alkaline catalyst.

79923. 22 December 1961 : **Manufacture of hexachloroethane**—M. A. Bhat, M. Goswamy and M. U. Pai.

80742. 14 February 1962 : **A process for the production of diesel fuel from low temperature coal tar or fractions thereof**—B. N. Rao, K. M. Murad, R. Vaidyeswaran, A. V. Ramaswami, M. G. Krishna and S. H. Zaheer, RRL, Hyderabad.

Subjecting low temperature tar or its fractions to distillation at above atmospheric pressure which is contributed from its own vapours.

80906. 22 February 1962 : **Improvements in or relating to the telephony communication system**—M. Shamsuz Zoha, CMERI, Durgapur.

FIGURE-4.

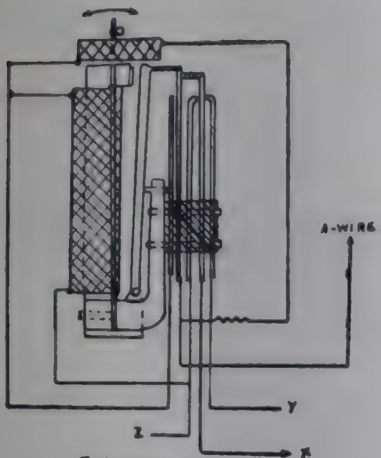


FIGURE - 3.

FIGURE -5

80998. 28 February 1962: **Isolation of a group of physiologically active compounds from calophyllum isophyllum**—R. B. Arora and T. R. Seshadri, AIIMS, New Delhi.

81071. 5 March 1962: **Improvements in or relating to the recovery of nickel and fat from spent nickel hydrogenation catalyst**—M. N. Sankarashanamuthy and A. B. Biswas, NCL, Poona.

81072. 5 March 1962: **Improvements in or relating to the preparation and production of catalysts for the hydrogenation of organic substances with particular reference to fatty oils**—M. N. Sankarashanamurthy and A. B. Biswas, NCL, Poona.

81247. 15 March 1962: **An improved moulding device for the preparation of soil specimens for unconfined compressive strength test**—D. K. Sundd and A. K. Bhattacharya, Agra College, Agra.

Comprising a split mould severable into two halves and having a cutting edge.

81279. 11 March 1962: **Improvements in or relating to the process for insect proofing of gunny bags for storage of food grains**—S. K. Majumder, J. K. Krishna Rao and H. G. Sethumadhavan, CFTRI, Mysore.

A process for the insect proofing of gunny bags by treating them with a water dispersible emulsion prepared by mixing (A) a purified insecticides fraction with (B) an oil emulsion characterised in that the fraction (A) is obtained by mixing solvent (such as acetone, xylene or toluene) solutions of insecticides purified as indicated below:

Insecticide	Purification is effected by differential solubilization in the following solvents:
(*i*) Technical hexachlorocyclohexane	methyl alcohol or warm kerosene (40–50°C)
(*ii*) Technical dichlorodiphenyltrichloroethane	acetone
(*iii*) Technical 0, 0,-dimethyl dithiophosphate of diethyl mercaptosuccinate	ethylene glycol followed by ethyl alcohol or xylene

The active insecticidal ingredients are separated from technical hexachlorocyclohexane; technical dichloro-diphenyltrichloroethane and technical O, O,-dimethyl dithiophosphate of diethyl mercapto-succinate respectively by cryometric crystallization; the said insecticidal ingredients are dissolved in solvents such as acetone, xylene or toluene, and the solutions are mixed to form fraction (A). Fraction (A) is stored separately from the fraction (B) until their use for preparation of a water dispersible emulsion.

The purification of technical hexachlorocyclohexane by differential solubilization is effected as follows: The technical hexachlorocyclohexane is treated with 3 times the volume of methyl alcohol or warm kerosene (40–50°C) in which the non-insecticidal isomers and impurities are relatively insoluble, the soluble fraction in the solvent is cryometrically crystallised and the fractions are collected at 15, 7 and 0°C. The solvent containing further quantity of the active insecticidal hexachlorocyclohexane isomers in solution is concentrated distilling off the solvent; the crystal crops are washed with cold *iso*-propyl alcohol (15—23°C) and the washed crystals are dissolved in acetone, chloroform or carbon tetrachloride for use in the preparation of the formulation.

The purification of technical dichlorodiphenyltrichloroethane by differential solubilisation is effected as follows: Technical dichlorodiphenyl trichloroethane is dissolved in equal volume of acetone and the active insecticidal component is crystallised from acetone solution by adding water; the crystallised product is separated by filtration and washed with ethyl alcohol to remove major fraction of the o, p′-dichlorodiphenyltrichloroethane; and residual moisture from p, p′-dichlorodiphenyltrichlorolethane. The p, p′-dichlorodiphenyltrichloroethane is then dissolved in benzene or xylene or toluene for use in the preparation of the formulation.

The purification of technical O, O,-dimethyl dithiophosphate of diethyl mercapto-succinate is effected as follows: The technical O, O,-dimethyl dithiophosphate of diethyl mercapto-succinate is treated with ethylene glycol and the undissolved fraction is taken in twice its volume of ethyl alcohol or xylene; this is purified further by passing through a mixture of active carbon, activated clay and silica gel (10 : 20 : 70 parts) columns and the eluted material is filtered under vacuum and dissolved in either xylene, toluene or carbon tetrachloride.

Fraction B is made by mixing high viscosity oils such as 'jute batching oil'; petroleum compounds light brown oil (used as medium batching oil in textile industry and extenders for surface coating industry); groundnut oil, coconut oil and sesame oil with emulsifiers such as, octylcresol, polyether alcohol, octylcresol polyether alcohol paste, 'sulphated castor oil', fatty alcohol ethylene oxide condensate, alkylated aryl polyether alcohol, and, polyoxyethylene sorbitanmonooleate.

81402. 26 March 1962 : **Improvements in or relating to electro-deposition of metals, particularly manganese, by direct current electrolysis of aqueous solutions containing metal ions**—T. Banerjee and Dhananjayan, NML, Jamshedpur.

Adding selenium compounds to electrolytic bath.

81403. 26 March 1962 : **Improvements in or relating to devices for the conversion of pig-irons into high grade steels**—M. J. Shahani and Upkar Singh, NML, Jamshedpur.

Wherein air is blown through wind receiver concentric with solid support shaft and wind boxes.

81779. 16 April 1962: **Process for enamelling of iron or steel directly with white or coloured vitreous enamels**—Atma Ram, S. S. Verma and V. G. Upadhyaya.

A process for enamelling iron or steel directly with white or coloured vitreous enamels for the manufacture of enamel ware which consists in treating a clean blank steel ware in a bath of an aqueous solution containing one or more acids selected from the groups comprising nitric acid, phosphoric acid, citric acid, sulphuric acid, oxalic acid, and acetic acid, heating the treated ware to 600—800°C, washing the ware with aqueous solution containing one or more chemicals from the group comprising oxalic acid, sodium oxalate, potassium oxlate, drying, applying a white or coloured enamel directly to the steel ware and firing the ware to the requisite temperature depending upon the nature of the enamel used. The process comprises dipping the blank steel ware in a bath of 5—10% aqueous solution of one or more of the acids selected from the group comprising nitric acid, phosphoric acid, citric acid, acetic acid, sulphuric acid and oxalic acid. The bath of aqueous solution used for treating the steel ware by dipping is maintained at a temperature of 50—100°C. The iron ware is thoroughly washed with a 1—5% aqueous solution of one or more chemicals from the group comprising : oxalic acid, sodium oxalate and potassium oxalate.

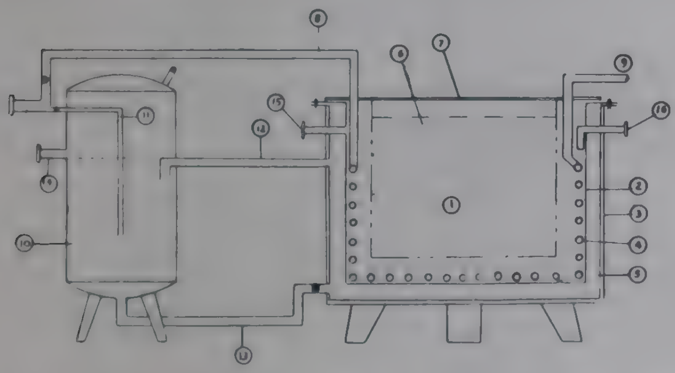
82189. 10 May 1962: **Production of dextro-tartaric and oxalic acids**—H. G. Vartak, S. G. Patil and V. Jagannathan, NCL, Poona.

A process for the production of dextro-tartaric acid and oxalic acid by oxidation of 5-keto-d-gluconic acid which is characterised in that the oxidation of 5-keto-d-gluconic acid or its salts in water is carried out with air or oxygen-containing gases with or without catalysts. 5 Keto-d-gluconic acid or its salts are employed as a suspension or solution in water is proportion of 2 to 50 parts per 100 parts of water. The oxidation is carried out at *p*H 3—13. Alkalies chosen from a group consisting of hydroxides, carbonates and bicarbonates of alkali, ammonium and alkaline earth metals are added to the reaction mixture. The amount of alkalies employed are in the proportion of 0·1—50 parts per 100 parts of the reaction mixture. The oxidation is carried out at 0—85°C and at a gas pressure of 0·5—50 atmospheres. It is carried out effectively with gases containing 1—100 oxygen.

82190. 10 May 1962 : **Improvements in the process for the preparation of desiccant from gypsum**—Mirza Raza Ali, M. A. Hai, D. S. Datar and S. H. Zaheer, RRL, Hyderabad.

Consists in treating partially dehydrated gypsum lumps with water followed by soaking them in potash alum solution prior to their final dehydration.

82191. 10 May 1962 : **An improved jacketted electrolytic cell for the electrodeposition of metals and metallic oxides in general and manganese dioxide in particular**—M. J. Shahani and T. Banerjee, NML, Jamshedpur.



Electrolysis is carried out in a double walled electrolytic cell which is connected to a surge tank whose contents are continuously circulated into the annular space of the double walled cell for temperature control.

82192. 10 May 1962 : **An apparatus for the automatic collection of atmospheric pollen and spores**—P. K. K. Nair and K. N. Kaul, NBG, Lucknow.

Comprises a wheel around which is wound an adhesive coated alkathene tape, a second wheel fitted to clock and third wheel from which fresh tape comes.

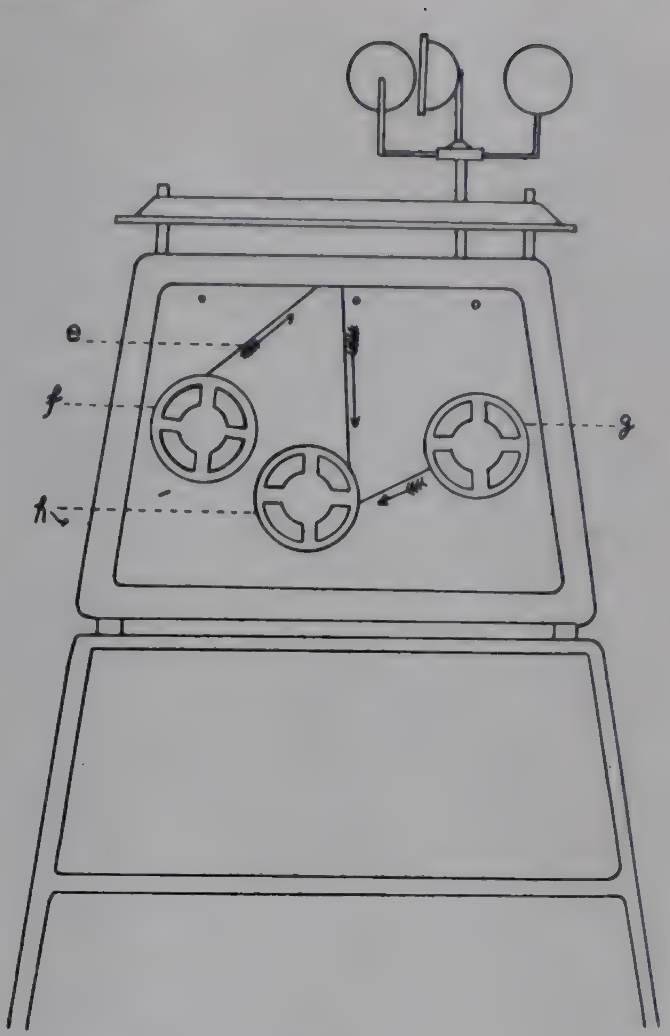
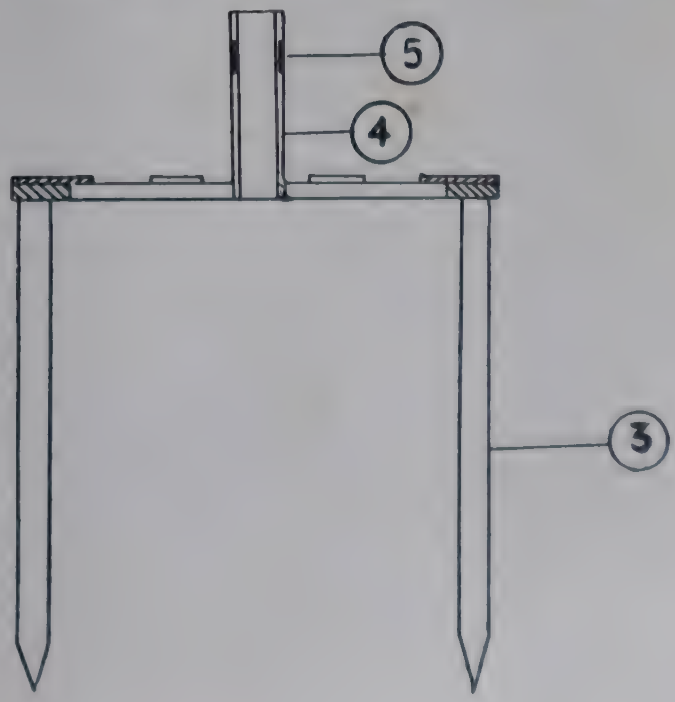


FIG. 2

82303. 18 May 1962 : **A guide for making holes with augers**—Subash Chandar and A. K. Deb, CBRI, Roorkee.



Wherein the cylindrical pipe is formed by two half-pipes, each welded perpendicularly to a hinged cover-plate attached to a legged frame.

82446. 26 May 1962: **An improved melt-pot and furnace for the continuous hot dip aluminizing of steel strip and wire**—M. J. Shahani and P. K. Gupte, NML, Jamshedpur.

82822. 18 June 1962: **A process for the manufacture of high alpha cellulose dissolving grade pulps by alkaline pulping methods**—G. M. Vyas, D. S. Bendale and M. B. Mahajan, NCL, Poona.

Characterised in that digestion is carried in two stages, (i) alkaline cooking with alkaline liquor in the range of 30–100 g. per litre at 100–180°C until pentosan removal is reduced, and (ii) cooked chips again cooked with alkali in the range of 30–125 g. per litre at 140–180°C until pentosan content is about 2–5%.

83364. 21 July 1962: **Manufacture of hexachloroethane**—N. A. Bhat, M. Goswami and M. U. Pai, NCL, Poona.

Chlorinating ethylene or ethylene dichloride over activated charcoal or carbon impregnated with cupric chloride as catalyst.

83365. 21 July 1962: **Magnesium copper sulphate non-polarisable batteries**—P. B. Mathur and N. J. Paul, CECRI, Karaikudi.

A magnesium cell or a battery system comprising magnesium and copper or copper deposited on another material as electrodes and copper sulphate solution or powder or paste as the electrolyte.

83651. 10 August 1962: **Improved dross shield**—M. J. Shahani, NML, Jamshedpur.

83652. 10 August 1962: **Improvements in or relating to magnesite refractories**—M. R. Rao, A. Dutt, H. V. B. Ras and P. C. Sen, NML, Jamshedpur.

Comprises by burning the same above 1200°C, preferably 1500 and 1650°C followed by magnetic separation, whereby two highly refractory products are obtained.

83716. 14 August 1962: **Manufacture of nicotine sulphate from tobacco or tobacco wastes**—M. Goswami, G. V. Potnis, V. Ramachandran and M. U. Pai, NCL, Poona.

A process for the manufacture of nicotine sulphate which consists in extracting nicotine with water from alkali treated tobacco or tobacco waste, transferring nicotine present in aqueous extract to an organic solvent and fixing the nicotine present in the solvent as nicotine sulphate by treatment with sulphuric acid. The tobacco or tobacco waste is treated only with cheap alkali such as lime prior to aqueous extraction of nicotine present in it. The alkali-treated tobacco is extracted with water alone about four times the weight of tobacco without the use of any agent or any compound which favours the extraction of nicotine. The aqueous extract obtained is about three times the weight of tobacco treated and has *p*H between 10·0 and 10·5. It is directly treated without any further treatment with kerosene in particular (or any other organic solvent), ratio of aqueous extract to kerosene being 2 : 1 (or a suitable ratio depending on the partition coefficient of the nicotine between broth and the elutant at the operating conditions with other solvents such as benzene, xylene, toluene, chlorobenzene, dichloroethylene, cyclohexane or the like). The liquid-liquid extraction is carried out in an ordinary stirred vessel specially suitable for batch processing and also adaptable for continuous operations. The operation is preferably carried out at 45°C for kerosene (or at suitable temperature for other solvents depending on the nature of the solvents to avoid formation of emulsion). Nicotine sulphate solution is produced by treating the solvent extract, with sulphuric acid The loss of solvent used is low and the denicotinised solvent without any treatment is recycled in the process.

83742. 16 August 1962: **N-alkylaminoalkyl-benzylamines**—Y. S. Saldana, P. B. Sattur, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

83743. 16 August 1962: **New heterocyclic compounds of pharmacological interest**—Y. S. Saldana, P. B. Sattur, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

83744. 16 August 1962 : **N-haloacylbenzylamine derivatives**—Y. S. Saldana, P. B. Sattur, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

83779. 20 August 1962 : **Novel heterocyclic amides and preparation thereof**—G. Thyagarajan, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

83827. 22 August 1962 : **Novel N-haloacyl-1, 2, 3, 4-tetrahydroquinolines and preparation thereof**—G. Thyagarajan, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

83874. 27 August 1962 : **A process for the treatment of fish body oil**—M. R. Verma, V. D. Puri and J. Rai, NPL, New Delhi.

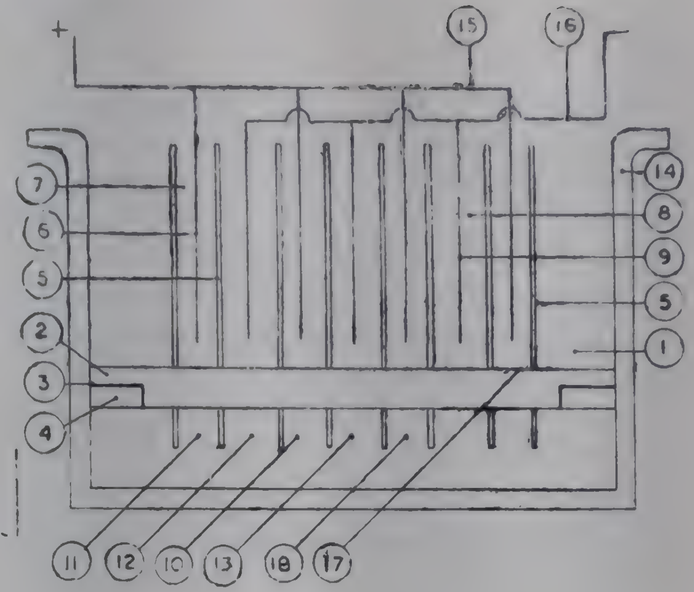
A process for the treatment of fish body oil to deodorise the oil and render it suitable for use in paint and ink industries which consists in heat polymerisation of the fish body oil in presence of a catalyst consisting of a metallic oxide. The metallic oxide consists of calcium oxide to obtain a polymerised oil which is suitable for glossy finish paints. Litharge, zinc chloride or the like may also be used as a catalyst. The fish body oils are polymerised at 250–300°C. The heating is done for 1–3 hr. for obtaining polymerised oils suitable for making air drying and stove enamels.

83968. 3 September 1962 : **A method for reconditioning the coated magnesium powder s**—V.S. Sampath, G. Basak and P. P. Bhatnagar, NML, Jamshedpur.

Comprises removing the oxide, carbonate, hydroxide, nitride and other coating formed during the manufacture or storage of magnesium powder, by treatment with chromic acid solution.

84202. 19 September 1962 : **Heterocyclic compounds of pharmacological interest**—P. P. Rao, P. B. Sattur, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

84670. 19 October 1962 : **Improvements in or relating to electrolytic cells**—N. Dhananjayan, H. K. Chakrabarti, T. Banerjee and R. C. Verma, NML, Jamshedpur.



As electrolytic cell comprising a cell vessel having a false bottom wherein the cell vessel is provided with a parapet wall to support the false bottom. The parapet wall is a narrow horizontal wall rigidly secured round the inside wall of the cell vessel above the bottom of the cell vessel. A resilient gasket is placed between the upper surface of the parapet wall and the under surface of the false bottom plate to ensure substantially leakproof contact of the two surfaces. The removable false bottom plate is made of flat plates of wood, synthetic resin, metal or similar rigid material and is slightly smaller than the horizontal section of the cell vessel but is large enough to find support on the parapet wall. It is provided with or without rigidly secured diaphragm frames and electrode guides. The communicating channels for liquids and solids are provided from the upper side of the false bottom plate to the underside of the false bottom plate by making openings on the said plate. The portions of the false bottom plate bounded by the cross sections of the diaphragm frames are partially or completely cut open to allow free passages for solids and liquids from inside the diaphragms to the underside of the false bottom plate. The diaphragm material tubular pieces of canvas cloth, glass cloth, synthetic resinous cloth or any porous sheet material, open at both ends are slid down the diaphragm frames enclosing the space within the frames.

84827. 29 October 1962 : **N-haloacyl-1 : 2-diphenyl-ethylamines**—P. P. Rao,

P. B. Sattur, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

84828. 29 October 1962 : **A process for the separation of psoralen and isopsoralen from a mixture of psoralen-isopsoralen**—R. V. Desai, S. Bhattacharji and M. L. Dhar, CDRI, Lucknow.

85148. 16 November 1962 : **A process for the preparation of dihydrojasmone and α-undecalactone (peach aldehyde)**—S. G. Patnekar, B. M. Dubash, H. H. Mathur and H. C. Bhattacharyya, NCL, Poona.

85172. 17 November 1962 : **Improvements in or relating to the production of diisocyanates**—R. T. Thampy and S. R. Goel, SRIFIR, Delhi.

A process for the production of diisocyanates which consists in reacting a diamine and carbonyl chloride (phosgene) in a fluid bed reactor containing a liquid medium of boiling point above 350°C with inert particles like glass beads. The reaction is carried out by introducing a vapour of a diamine and hydrogen chloride and phosgene gas into a reactor containing (1) a liquid inert solvent having a boiling point above 350°C like polyphenyls or chlorinated aromatic compounds such as chlorinated polyphenyls, and/or O-dichlorobenzene and (ii) inert beads, the inert beads being kept fluidized by the vapours of the reactants and the product of reaction is collected by condensation. Phosgene with impurities like carbon monoxide is used. The diamine such as tolylene diamine, xylene diamine, hexamethylene diamine (1, 6) and 1, 5 naphthalene diamine may be used.

85446. 4 December 1962 : **Preparation of carboxylic cation exchange materials**—N. Krishnaswamy, V. K. Indusekhar and B. D. Dasare, NCL, Poona.

85447. 4 December 1962 : **Heat flow transducer**—M. L. Gupta, CBRI, Roorkee.

85527. 10 December 1962 : **Improvements in or relating to a process for the oxidation of hydrocarbons**—R. T. Thampy, M. S. Radhakrishna Rao and B. S. Trehan, SRIFIR, Delhi.

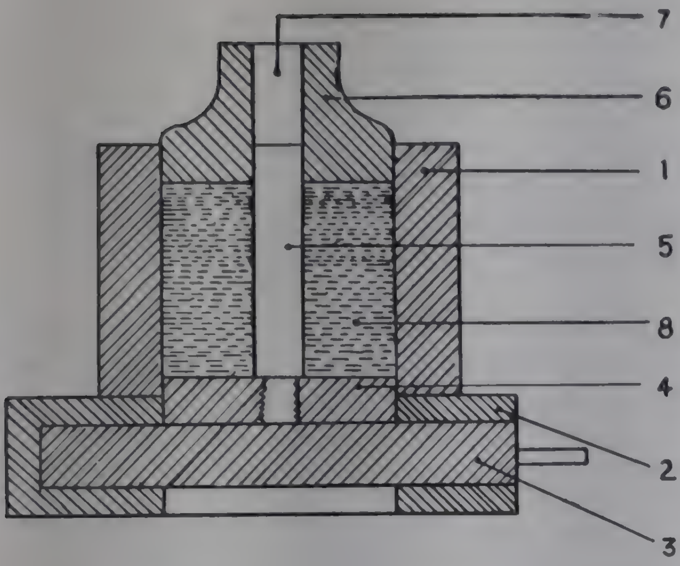
A process of catalytic oxidation of substituted organic aromatic compounds having one or more alkyl groups to mono-or polybasic carboxylic acids with oxygen or oxygen containing gases in liquid phase, by the use of a catalyst comprising essentially of cobalt and/or manganese in an acidic medium consisting of one or more aliphatic acids having two to four carbon atoms, wherein the water formed in the reaction is continuously removed. The water concentration, during reaction, is maintained between 0·1—5·0% by weight to obtain best yield of carboxylic acids. The catalyst is activated by adding a ketone like ethyl methyl ketone and/or bromide. The preferential oxidation of the hydrocarbons is achieved by adjusting the conditions like catalyst concentration, temprature and activator. The formation of the carboxylic acid is preceded by the formation of rose complex which is further converted to the green complex. The reaction is facilitated by continuously removing the rose complex formed and treating the same in another reactor thereby making the process a continuous one.

85608. 13 December 1962 : **An anti-stripping agent for road binders**—S. Bagchi, CRRI, New Delhi.

A process for the preparation of an anti-stripping agent for bituminous road binders which consists in reacting sulphonated vegetable oil with ferric chloride and dehydrating the product by heating or by solvent extraction. The sulphonated vegetable oil consists of (i) sulphonated castor oil, (ii) sulphonated rape seed oil, (iii) a mixture of (i) & (ii), mixture of sulphonated cashewnut shell liquid with (i) and/or (ii).

85787. 24 December 1962 : **Improvements in or relating to the manufacture of rods with core and shell of different materials**—G. J. Joglekar and C. L. Verma, NPL, New Delhi.

A method for the manufacture of rods with core and shell of different materials (such as carbon rods having (i) a core of rare earth fluorides mixed with binders and (ii) a shell of petroleum coke and lamp-black mixed with binders) which consists in making a compact of the shell mixture with a central hole, filling the hole with the core mixture, followed by extruding the compact containing the core mixture in the centre. The extruded rods have the core centrally placed



and the composition of the core is different from that of the shell and no mixing of the core and shell material takes place during the extrusion process. The plasticity of the shell mixture and the core mixture is maintained more or less similar by adjusting the binder content.

An apparatus for carrying out the above process consists of a mould wherein is provided a removable bottom plate with a central rod to create a hole in the compact when the shell mixture is compressed in the mould. The threads are cut in the bottom plate to fix central rods of different cross-section. The mould is provided with a detachable plunger with a central hole to receive the free end of the central rod. The shell mixture is compressed, the movable bottom plate as well as the solid plunger are removed, the hole thus formed in the shell mixture compact is filled up with the core mixture, the compact containing the core mixture in the centre is compressed to withstand handling operations and the compressed compact is extruded by means of a hydraulic press.

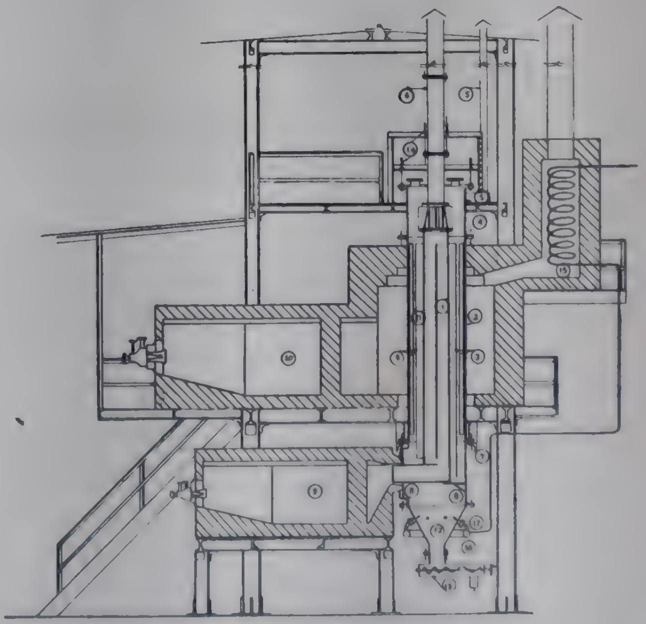
85788. 24 December 1963 : **A process for the preparation of a catalyst for the manufacture of meleic anhydride**—R. T. Thampy, S. K. Bhatnagar and B. S. Trehan, SRIFIR, New Delhi.

A process for the preparation of a catalyst for the manufacture of maleic anyhdride in fluidized or a moving fluidized bed which consists in thoroughly mixing and melting vanadium pentoxide with molybdenum trioxide, allowing the molten mixture to solidify in shallow layers on inert surface, followed by powdering the solidified mass. The melt is allowed to solidify by cooling to room temperatre (20—40°C) and the solidified mass is crushed and sieved to the required size. The crushed and sieved mass is made to fall through hot silica tube maintained at 900—1300°C. held vertically wherein the mass particles are softened and are rounded off during their free fall through cold layers of air.

85789. 24 December 1962 : **Utilization of groundnut shells for the manufacture of high alpha cellulose dissolving grade pulp and vanillin**—G. M. Vyas, D. S. Bandale, B. M. Mahajan, J. L. Bose, B. D. Modi, H. R. Sonawane and D. C. Bigg, NCL, Poona.

85860. 31 December 1962 : **2,-3-substituted 4 (3H) quinazolones of pharmacological interest**—P. B. Sattur, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

85959. 7 January 1963 : **A reactor for carrying out high temperature reactions involving solids and gases**—K. Seshacharyulu, Y. Venkatesham, D. S. Datar and S. H. Zaheer, RRL, Hyderabad.



Consists of concentric vertical pipes for carrying out reactions involving solids and gases held in the annular space and indirectly heated by hot furnace gases.

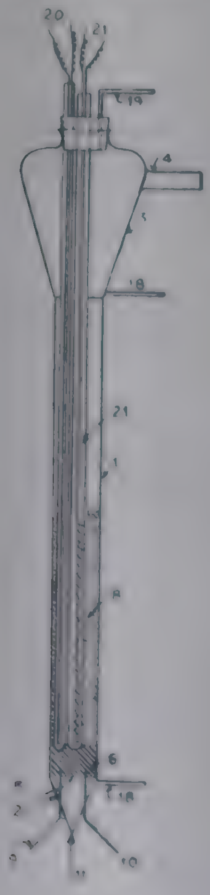
86155. 22 January 1963 : **Substituted phenothiazines**—(Kumari) S. B. Moray, G. Thyagarajan, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

86156. 22 January 1963: **Amides of pharmacological interest**—M. B. Husain, G. Thyagarajan, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

86382. 6 February 1963: **An improved process of coal flotation by use of grids**—A. R. Ray, B. B. Konar, G. C. Sarkar and A. Lahiri, CFRI, Jealgora.

86383. 6 February 1963: **Process of treating mixed salt for potash alum**—K. Seshadri, G. D. Bhat and J. R. Sanghavi, CSMCRI, Bhavnagar.

86541. 18 February 1963: **A reactor for carrying out highly exothermic and explosive reactions particularly suited for chlorination of methane**—S. P. Mukherjee, A. D. Deshpande, G. V. Potnis and M. U. Pai, NCL, Poona.



Wherein is maintained a fixed zone of suitable solid of appropriate size at the reactor bottom directly on the supporting sieve plate and then is superimposed with a fluidized zone of solid particles.

86638. 25 February 1963: **A process for the preparation and synthesis of 2-isopropenyl hexanols**—Suryakumari Ramaswami, S. K. Ramaswami and S. C. Bhattacharyya, NCL, Poona.

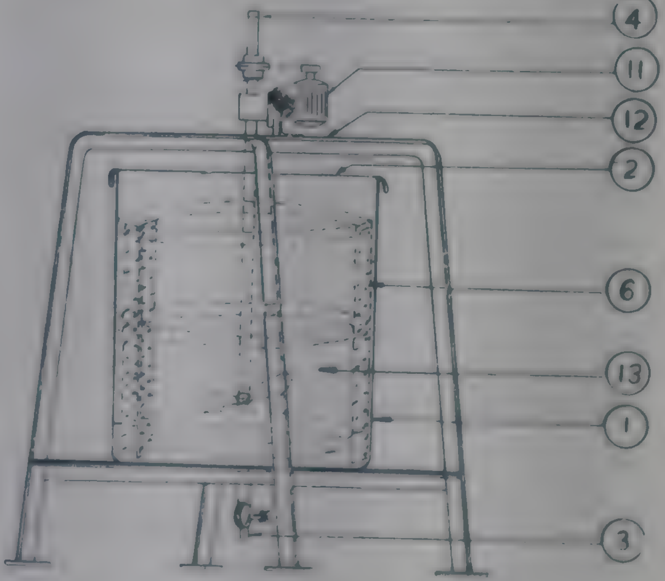
86639. 25 February 1963: **An inexpensive chemical method of dicing a semiconductor slice for the manufacture of transistor family devices**—K. S. Balain, CEERI, Pilani.

86823. 6 March 1963: **A new process for the production of nitrogenous fertilizers and soil conditioner**—P. N. Mukherjee, J. N. Bhaumik and A. Lahiri, CFRI, Jealgora.

Characterized by the fact that the materials are suspended in ammoniacal liquor and subjected to the action of oxygen or air.

86991. 16 March 1963: **Preparation of polyurethane base printing rollers**—N. D. Ghatge and S. L. Kapur, NCL, Poona.

87428. 16 April 1963: **Improvements in or relating to the decolorization of mineral substances such as clay or sand**—Atma Ram, S. Sen and S. K. Guha, CGCRI, Calcutta.



Wherein the blunging operation is carried out in a receptacle provided with perforated slabs made of or coated with zinc.

87434. 16 April 1963: **Acid washing, scouring, bleaching and softening of tannery goat hair, wool, buff and camel hair**—S. K. Barat, CLRI, Madras.

87435. 16 April 1963 : **Dyeing of wool, hair and other keratinous fibres into a fast non-bleeding jet black shade**—S. K. Barat, CLRI, Madras.

Wool and the like fibres are treated with a solution containing ferrous sulphate and sodium hydrosulphite, then treated with babul, goran or any other catechol type of tanning material and then finally with an emulsion of sulphated oil, mineral oil and non-ionic sulphated fatty alcohol.

87529. 20 April 1963 : **A process for separating and isolation of lecithin from Pithecolobium dulce seed**—S. K. Nigam, C. R. Mitra and K. L. Kaul, NBG, Lucknow.

87671. 29 April 1963 : **A process for the direct solvent extraction of fresh coconut kernels for recovery of oil and edible meal**—B. H. Krishna, V. B. Shanbhag, K. G. Ramaswamy and M. V. Rao, CFTR, Mysore.

87815. 7 May 1963 : **Process for the preparation of box strapping from paper and indigenous fibres**—P. Veerraju, B. Anandaswamy, N. V. R. Iyengar and A. Sreenivasan, CFTRI, Mysore.

87816. 7 May 1963 : **Device of studying the electrophoretic velocity of colloidal particles**—Arvind Kumar, P. D. Bhatnagar and A. K. Bhattacharya, Agra College, Agra.

87957. 15 May 1963 : **Production of levan and related polymers by fermentation using a locally isolated micro-organism**—B. M. Gupta and Ivan Clifford, CDRI, Lucknow.

87958. 15 May 1963 : **Expansion joint fillers from coconut pith, a waste product of the coir industry**—T. N. Sharma, M. L. Puri and K. L. Shethi, CRRI, New Delhi.

87849. 8 May 1963 : **Novel aralkylpropionamides of pharmacological interest**—Y. S. Sadanandam, K. Bhanumati, P. B. Sattur, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

87992. 16 May 1963 : **Direct preparation of wax esters by fatty acids hydrogenolysis**—A. J. Pantulu, K. T. Achaya, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

87991. 16 May 1963 : **Preparation of saturated, unsaturated and hydroxy fatty alcohols by hydogenolysis**—A. J. Pantulu, K. T. Achaya, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

87993. 16 May 1963 : **Improvements in or relating to soft ferrites**—T. V. Ramamurti, C. V. Ganapathy, R. Krishnan, A. Ahmed and C. Govindaswamy, NPL, New Delhi.

87994. 16 May 1963 : **Development of a solid rust-remover**—N. Subramanyan and M. Sundaram, CECRI, Karaikudi.

88019. 18 May 1963 : **A yarn tension measuring and recording instrument**—A. Pande, S. R. Ranganathan and G. S. Ganesan, SRIFIR, Delhi.

88213. 30 May 1963 : **Physiologically active amides derived from 1, 2-diphenylethylamines**—P. P. Rao, P. B. Sattur, G. S. Sidhu and S. H. Zaheer.

88214. 30 June 1963 : **A new clinching device to seal fibre straps on packages**—P. Veerraju, CFTRI, Mysore.

88568. 24 May 1963 : **A process for the preparation of an anticonvulsant composition based on 3-b-N-dialkyl or arylaminoalkyl-quinazols-4-thiones and quinazol-4-ones**—A. P. Bhaduri, N. M. Khanna and M. L. Dhar, CDRI, Lucknow.

88569. 24 June 1963 : **A device for raising or releasing of weights**—K. C. Srivastava and G. Singh, NPL, New Delhi.

88851. 10 July 1963 : **Improvements in or relating to the electrolytic reduction of benzoic acid to benzyl alcohol**—H. V. Udupa, G. S. Subramanian, K. Natarajan and K. S. Udupa, CECR, Karaikudi.

89004. 20 July 1963 : **A polycrystalline p-n junction photovoltaic solar cell**—A. U. Momin and A. P. B. Sinha, NCL, Poona.

89325. 8 August 1963: **N-haloacyl-2, 3-dihydro-1, 4-benzoxazones**—(Kumari) S. B. Moray, M. Mazharuddin, G. Thyagarajan, G. S. Sidhu and S. H. Zaheer, RRL, Hyderabad.

89536. 22 August 1963: **Improvements in or relating to the manufacture of fruit and vegetable preserves**—B. S. Ramachandra and S. S. Kalbag, CFTRI, Mysore.

89685. 31 August 1963: **A process for the preparation of pancreatin from buffalo pancreas**—A. C. Majumdar, R. Sen and P. D. Mathur, CDRI, Lucknow.

90039. 27 September 1963: **Novel heterocyclic amides and process for their preparation**—(Kumari) S. B. Moray, M. Mazharuddin, G. Thayagarajan and G. S. Sidhu, RRL, Hyderabad.

90057. 28 September 1963: **Improvements in or relating to electric incandescent filament lamps**—Atma Ram, B. M. Bishai and Jagdish Prasad, CGCRI, Calcutta.

90058. 28 September 1963: **Improvements in or relating to focussing devices for projection lamps in paraboloidal or like shaped reflectors**—B. M. Bishui and J. Prasad, CGCRI, Calcutta.

90092. 1 October 1963: **Improvements in or relating to fire retardment paints**—S. B. Roy and D. B. Gupta, CGCRI, Calcutta.

90112. 3 October 1963: **Preparation of anion-exchange resins from tar acids, phenols, cresols and the like**—J. N. Bhaumik, P. N. Mukherjee, S. K. Mallick and A. Lahiri, CFRI, Jealgora.

90113. 3 October 1963: **Improvements in or relating to a process for the metallisation of non-conductors**—S. B. Roy, S. S. Mandal and H. D. Sarcar, CGCRI, Calcutta.

90238. 11 October 1963: **A microscope eyepiece graticule for rapid determination of projected specific surface of particulate material**—S. Guruswamy, CHRS, Dhanbad.

90469. 23 October 1963: **Processing of dry ready-to-wet sausage—casings from cattle, goat, pig and sheep**—S. K. Barat, CLRI, Madras.

90470. 23 October 1963: **Improvements in or relating to the manufacture of lime-surkhi mixtures from surkhi manufactured in down-draught kiln**—N. R. Srinivasan, M. L. Bhatia, R. K. Ghosh and Prof. S. R. Mehra, CRRI, New Delhi.

90574. 2 November 1963: **A process for the preparation of oil muscone**—M. S. P. Ramachandran Nayar, H. H. Mathur and S. C. Bhattacharyya, NCL, Poona.

90575. 2 November 1963: **Improvements in or relating to polyesters**—R. T. Thampy, Miss T. Dey, M. Krishnan and S. P. R. Nair, SRIFIR, Delhi.

90674. 6 November 1963: **Activated carbon for phosgene manufacture**—R. T. Thampy and S. R. Goel, SRIFIR, Delhi.

90675. 6 November 1963: **Improvements in or relating to the manufacture of phosgene (carbonyl chloride)**—R. T. Thampy and S. R. Goel, SRIFIR, Delhi.

90676. 6 November 1963: **A process for the extraction and recovery of phenols from distillates of coal tar and mineral oil distillates containing phenols**—S. Moinuddin Ahmed, Y. V. Subba Rao, R. Vaidyeswaran and G. S. Sidhu, RRL, Hyderabad.

90677. 6 November 1963: **A new method for the preparation of formic acid**—H. G. Vartak, S. G. Patil and S. V. Paranjpe, NCL, Poona.

90906. 21 November 1963: **Improvements in or relating to relay operated sequential switching devices**—Ram Parshad, NPL, New Delhi.

90907. 21 November 1963: **A process for the recovery of elemental sulphur and or production of sulphur dioxide from pyrites**—A. Lahiri, N. G. Basak, G. Rao, N. Biswas, S. Banerjee and S. P. Chowdhury, CFRI, Jealgora.

90957. 23 November 1963: **Preparation of porous carbon electrode using vegetable carbons for use in air depolarised cells**—A. K. Abdul Waheed, K. V. N. Rao and K. S. G. Doss, CECRI, Karaikudi.

91085. 2 December 1963: **A process for the disproportionation of alkyl benzene**—G. S. Bhargava, Pierre Duhaut and Gerard Follain, I.I.P., Dehradun.

91134. 4 December 1963: **Improvements in or relating to a precision temperature controller for use with electric resistance furnaces up to 1600°C**—K. P. S. Kumar and A. P. Chowdhury, NML, Jamshedpur.

91151. 5 December 1963: **Isolation of a substance possessing powerful respiratory stimulant from Prangos pabularia linn**—I. C. Chopra, K. S. Jamwal, K. L. Handa and V. P. Mahajan, RRL, Jammu and Kashmir.

91290. 13 December 1963: **Improvements in or relating to an apparatus for the measurement of gel time of thermosetting resins**—A. Pande, M. Krishnan and S. K. Bhatnagar, SRIFIR, Delhi.

91411. 20 December 1963: **A new soil sampler—**A. K. Deb and V. S. Aggarwal, Roorkee.

91412. 20 December 1963: **Manufacture of 2-3 hydroxynaphthoic acid from 2-naphthol in the presence of a dispersent**—P. G. Phadtare, K. R. Srinivasan, B. A. Baliga, M. G. Kotasthane and L. K. Doraiswamy, NCL, Poona.

91430. 23 December 1963: **Improvements in or relating to reconstituted mica**—Atma Ram and Satya Bhusan Roy, CGCRI, Calcutta.

91827. 21 January 1964: **Improvements in or relating to an apparatus for automatically recording progressive changes in weights with special reference to thermogravimetric determinations**—A. P. Chowdhury, K. P. S. Kumar and H. P. Srinivasamurthy, NML, Jamshedpur.

91828. 21 January 1964: **Improvements in or relating to the preparation of sintered silver electrodes**—P. B. Mathur and N. Karuppannan, NML, Jamshedpur.

92035. 1 February 1964: **Method for the manufacture of new antibiotic called "Jawaharene"**—Durlav Krishna Roy, IIBEM.

92113. 5 February 1964: **Improvements in or relating to bituminous binders and aggregates having anti-stripping properties for road and building construction work**—S. Bagchee, CRRI, New Delhi.

92273. 14 February 1964: **A process for vacuum-puffing and dehydration of vegetables**—K. E. Eapen, CFTRI, Mysore.

92274. 14 February 1964: **A process for the production of moulded porous products from vegetables**—K. E. Eapen, CFTRI, Mysore.

92275. 14 February 1964: **Cinnamic acid amides of pharmacological interest**—P. B. Sattur, K. Bhanumati and G. S. Sidhu, RRL, Hyderabad.

92276. 14 February 1964: **A process for the production of puffed cereals**—K. E. Eapen, CFTRI, Mysore.

92277. 14 February 1964: **Improvements in or relating to process of production of ceramic rods for pyrolytic carbon resistors**—Shiv Sharan and S. Rangarajan, NPL, New Delhi.

92278. 14 February 1964: **N-substituted 1, 2-diphenylethylamine derivatives of pharmacological interest**—P. P. Rao, P. B. Sattur and G. S. Sidhu, RRL, Hyderabad.

92292. 17 February 1964: **Improvements in or relating to the manufacture of phosgene (carbonyl chloride)**—R. T. Thampy and S. R. Goel, SRIFIR, Delhi.

92526. 29 February 1964: **Improvements in or relating to pitch mastic compositions**—C. G. Swaminathan, B. C. Mazumdar and B. S. Mongia, CRRI, New Delhi.

92721. 11 March 1964: **Improvements in or relating to a new depolariser mix**

for use in alkaline primary cells—M. A. V. Devanathan, N. Ramaswamy and S. Venkatesan, CECRI, Karaikudi.

92757. 13 March 1964 : **Improvements in or relating to the treatment of cellulosic materials to render them rotproof and for waterproof**—R. M. Desai, A. K. Jain and S. M. Dhanigond, SRIFIR, New Delhi.

92758. 13 March 1964 : **Improvements in or relating to the treatment of cellulosic materials to render them resistant to micro-organisms**--R. M. Desai, A. K. Jain and S. M. Dhanigond, SRIFIR, New Delhi.

92976. 26 March 1964 : **Improvements in or relating to the isolation of trilauric or lauric acid from the fruits of cinnamomium cecidodaphne meisson**—A. Singh, S. N. Srivastava, V. N. Sharma and K. N. Kaul, NBG, Lucknow.

92977. 26 March 1964 : **Improvements in or relating to the manufacture of hexachloroethane**—S. P. Mukherjee, M. Goswami, S. Soundarajan, N. Sadasivan, R. N. Sen and L. K. Doraiswamy, NCL, Poona.

92978. 26 March 1964 : **Preparation of solasodine from Solanium aviculare leaves**—Tej Singh, V. N. Vashist and K. L. Handa, RRL, Jammu & Kashmir.

93032. 31 March 1964 : **An improved process for producing coal fertilizers**—S. K. Banerjee, R. K. Chkrabarti, B. K. Bhattacharya and D. K. Banerjee, CFRI, Jealgora.

93146. 6 April 1964 : **A yarn tension recording and measuring instrument**—A. Pande and S. R. Ranganathan, SRIFIR, Delhi.

93147. 6 April 1964 : **Improvements in or relating to the easy removal of synthetic enamel from enamel coated copper wires**—K. Raman, NML, Jamshedpur.

93481. 27 April 1964 : **A process for the preparation of motor spirit, diesel oils and kerosene-substitutes from primary coal tar fractions**—A. Mirza, M. A. Masood, A. V. Ramaswamy, S. A. Qader and R. Vaidyeswaran, RRL, Hyderabad.

93482. 27 April 1964 : **A process relating to improvements in or relating to the manufacture of inks used for job printing, off-set printing, stencilling, finger printing or like purposes**—M. R. Verma, V. D. Puri and Jitendra Rai, NPL, New Delhi.

93575. 2 May 1964 : **A method to avoid cracking and warping of tiles made from plastic soils**—S. L. C. Jain, R. B. Hajela and N. K. Srivastava, CBRI, Roorkee.

93609. 4 May 1964 : **Simple and trialkyl gallates of 1-hydroxyalkyl—1, 2, 3, 4-tetrahydroquinolines**—S. H. Zaheer, G. S. Sidhu and D. Hejeebu, RRL, Hyderabad.

93610. 4 May 1964 : **1 (Hydroxyalkyl) — 1, 2, 3, 4-tetrahydroquinolines and preparation thereof**—S. H. Zaheer, G. S. Sidhu and D. Hejeebu, RRL, Hyderabad.

93611. 4 May 1964 : **3, 4, 5-Trimethoxy-benzamides derived from several bz-substituted 1,2,3,4-tetrahydro-quinolines and preparation thereof**—S. H. Zaheer, G. S. Sidhu and H. Dakshinamurthy, RRL, Hyderabad.

93612. 4 May 1964, **Tetrahydro —1, 5-benzoxazepines**—U. T. Bhalerao, G. Thyagarajan and G. S. Sidhu, RRL, Hyderabad.

93681. 11 May 1964 : **Production of black coatings on copper by anodisation**—R. L. Seth, P. N. N. Namboodri and P. B. Mathur, CECRI, Karaikudi.

93724. 11 May 1964 : **Substituted 2, 3-dihydro-4H-benzoxazines**—Shanta Naseem, M. Mazharuddin, G. Thyagarajan and G. S. Sidhu, RRL, Hyderabad.

93725. 11 May 1964 : **Improvements in or relating to hard ferrites**—T. V. Ramamurti, C. V. I. Ganapathy, R. Krishnan, A. Ahmed, S. C. Gupta and G. I. Govindaswamy, NPL, New Delhi.

93726. 11 May 1964 : **Improvements in or relating to the manufacture of**

lime-surkhi mixture from surkhi manufactured in down-draught kiln—N. R. Srinivasan, M. L. Bhatia, R. K. Ghosh and S. R. Mehra, CRRI, New Delhi.

93764. 14 May 1964: **Portland cement without gypsum**—D. K. Nath and D. Lahiri, University College of Science & Technology, Department of Applied Chemistry, Calcutta.

94216. 19 June 1964: **Hydrazine derivatives of pharmacological interest**—R. S. Verma and G. S. Sidhu, RRL, Hyderabad.

94271. 16 June 1964: **Improvements in or relating to a design of high speed automatic leads straightening and cutting machine**—Shiv Saran and Achhar Singh, NPL, New Delhi.

94766. 20 July 1964: **Improvements in or relating to the preparation of jatamansi root oil & the isolation of a coumarin constituent therefrom**—I. R. Unni, M. L. Maheshwari, S. K. Paknikar and S. C. Bhattacharyya, NCL, Poona.

94767. 20 July 1964: **An improved cast iron pot for the melting and holding of non-ferrous molten metal in general, aluminium & zinc in particular**—M. J. Shahani, NML, Jamshedpur.

94768. 20 July 1964: **An improved device for the solution of dross in molten metallic baths during continuous hot-dip processing of strip or wire**—M. J. Shahani, NML, Jamshedpur.

94769. 20 July 1964: **An improved device for the continuous hot-dip coating of metallic strip and wire**—M. J. Shahani, NML, Jamshedpur.

94863. 24 July 1964: **Improvements in or relating to the processing of textiles for imparting simultaneously improved tear resistance and abrasion resistance**—V. B. Chipalkatti, R. M. Desai, N. B. Sattur and I. Hussain, SRIFIR, Delhi.

94864. 24 July 1964: **A process for production of puffed pulses**—K. E. Eapen and P. K. Ramanathan, CFTRI, Mysore.

94932. 29 July 1964: **A solvent extraction process for the production of diesel oils and illuminants from primary coal tar and petroleum fractions**—S. A. Quader, A. Mirza, M. A. Masood and R. Vaidyeswaran, RRL, Hyderabad.

94933. 29 July 1964: **Continuous process for the disproportionation of alkyl benzenes**—G. S. Bhargava, P. Duhaut, M. Lal and N. Ray, IIP, Dehra Dun.

95026. 3 August 1954: **An Improved process for the manufacture of lindane form technical benzene hexachloride (hexachlorocyclohexane) and utilization of the waste products**—S. K. Majumdar and J. K. Krishna Rao, CFTRI, Mysore.

95074. 6 August 1964: **Improvements in or relating to a new depolariser mix for use in alkaline primary cells**—M. A. V. Devanathan, N. Ramasamy and S. Venkatesan, CECRI, Karaikudi.

95075. 6 August 1964: **Utilization of ground nut shells for the manufacture of vanillin**—G. M. Vyas, D. S. Bandle, M. B. Mahajan, J. L. Bose, B. D. Modi, H. R. Sonawane and D. C. Bigg, NCL, Poona.

Ground nut shells or ground nut shell lignin are oxidised at 150°–180°C for at least 3 hours in the presence of alkali and an oxidizing agent.

95076. 6 August 1964: **Improvements in or relating to the manufacture of lignin**—G. M. Vyas, D. S. Bendale, M. B. Mahajan, J. L. Bose, B. D. Modi, H. R. Sonawane and D. C. Bigg, NCL, Poona.

Ground nut shells are subjected to neutral sodium sulphite semi-chemical or sulphite pulping procedure to obtain spend liquor and treating the spent liquor with lime at *p*H near or above 12.

95165. 12 August 1964: **Synthesis of 1-phenyl-2 (and-3) (1'-azacycloheptyl)—propanones and propanols**—Nitya Anand, CDRI, Lucknow.

95166. 12 August 1964: **Synthesis of 1-phenyl-1 tertiary-amino-2-propanones and propanels**—Nitya Anand, CDRI, Lucknow.

95182. 13 August 1964: **A torque limiting spanner**—P. V. Pawar and N. V. Raman, CBRI, Roorkee.

95183. 13 August 1964: **A device for the heat treatment of articles**—M. K. Balchandani, V. P. Wasan and T. D. Bansal, NPL, New Delhi.

95305. 24 August 1964: **Improvements in or relating to pitch mastic compositions**—S. C. G. Swaminathan, B. C. Mazumdar and B. S. Mongia, CRRI, New Delhi.

95306. 24 August 1964: **Improvements in or relating to soldering of aluminium cables**—B. A. Shenoi, R. Subramanian and Azariah, CECRI, Karaikudi.

95415. 31 August 1964: **Improvements in or relating to the production of a concentrate from tamarind fruit pulp**—B. H. Krishna, K. R. Sreekantian and D. S. Johar, CFTRI, Mysore.

95416. 31 August 1964: **Improvements in or relating to the treatment of tamarind pulp for the extraction of useful components**—D. H. Krishna, L. S. Subba Rao and D. S. Johar, CFTRI, Mysore.

95417. 31 August 1964: **Improvements in or relating to an anode material for use in primary cells**—M. A. V. Devanathan, N. Ramaswamy and S. Venkatesan, CECRI, Karaikudi.

95418. 31 August 1964: **Improvements in or relating to Leclanche type dry cells**—M. A. V. Devanathan, N. Ramaswamy and S. Venkatesan, CECRI, Karaikudi.

95419. 31 August 1964: **Improvements in or relating to the sharpening of razor blades**—M. A. V. Devanathan, V. K. Venkatesan and S. Sarangapani, CECRI, Karaikudi.

95420. 31 August 1964: **Improvements in or relating to soldering of aluminium cables**—B. A. Shenoi, R. Subramanian and S. Chakrapani, CECRI, Karaikudi.

95421. 31 August 1964: **Improvements in or relating to bright nickel plating**—B. A. Shenoi and R. Subramanian, CECRI, Karaikudi.

95422. 31 August 1964: **Improvements in or relating to anode material for single shot battery**—P. L. Joseph, M. A. V. Devanathan, B. A. Shenoi and V. Balasubramanian, CECRI, Karaikudi.

95423. 31 August 1964: **Improvements in or relating to etching of Aantalum**—B. A. Shenoi, K. R. Narasimhan and K. L. Ramachandran, CECRI, Karaikudi.

95424. 31 August 1964: **Improvements in or relating to the thermosetting resinous composition**—S. P. R. Nair, M. Krishnan and R. T. Thampy, SRIFIR, Delhi.

95425. 31 August 1964: **Improvements in or relating to the electrochemical regeneration of chromic acid from chromium sulphate and sulphuric acid and use of the same for the oxidation of organic compounds and of P-nitrotoluene in particular to P-nitro benzonic acid**—H. V. Udupa, M. S. Venkatachalapathy and S. Chidambaram, CECRI, Karaikudi.

4. Laboratory-wise List

1940—64*

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Central Building Research Institue, Roorkee

1950

43866	5-10-50	Improvements in or relating to soil stabilization	S. K. Chopra

1953

48923	6-2-53	Production of signle-twisted or twin-twisted steel bars	K. Billig
49353	9-4-53	Construction of floors	K. Billig
49880	10-7-53	Improvements in and relating to the manufacture of pre-stressed concrete	K. Billig

1954

51026	11-1-54	Improvements in or relating to reinforced concrete structure	K. Billig
51084	18-1-54	Improvements in or relating to reinforced concrete construction.	K. Billig

1955

54361	28-4-55	Construction of flat or arched roofs or like structures	C. H. Khadilkar
54907	8-7-55	An under reaming tool	Dinesh Mohan & G. R. S. Jain
55510	30-9-55	A process for preparing foamed concrete	D. P. Ahuja & N. K. Patwardhan
55602	12-10-55	A brick or block making machine	Dinesh Mohan & D. S. Bhatnagar

1956

58909	17-11-56	New foaming agents for production of low density foamed concrete	G. W. Kapse & S. K. Chopra

1957

59630	13-2-57	An improved process of making bricks from sticky clays	N. C. Majumdar & N. K. Patwardhan
61645	5-9-57	A new process for the manufacture of pre-cast doubly curved shell elements for roofs, floors & panel walls	G. S. Ramaswamy & S. M. K. Chetty
62490	6-12-57	A process for creating deformations in the cable ducts in prestressed concrete structure	S. K. Narayana & S. M. K. Chetty

1958

63865	26-4-58	A tensioning screw jack	G. S. Ramaswami & S. K. Narayana
66079	26-4-58	Improvement in or modification with particular reference to a pressure measuring device for recording the tension	G. S. Ramaswami, S. K. Narayana & D. S. Bhatnagar

1959

69165	24-9-59	A method of making binding material from blast furnace slag	L. C. Jain & N. K. Patwardhan
70030	12-12-59	A method of making light weight aggregate from Indian clays	V. S. Ramachandran, N. C. Majumdar & N. K. Patwardhan
70173	26-12-59	Two wire anchorage grips	G. S. Ramaswami & S. K. Narayana

1960

70479	22-1-60	Preparation of a non-shrinking and low expanding cement	Mohan Rai, S. K. Chopra N. K. Patwardhan
72639	21-7-60	A method of making yellow coloured bricks from alluvial soil	L. C. Jain & P. C. Jain
74184	21-11-60	A new process for the manufacture of asbestos cement sheet tiles and similar materials having improved transverse strength using either chrysotile or amphibole variety of asbestos	A. K. Chatterji, K. D. Dhariyal & N. K. Patwardhan

1961

76018	30-3-61	New hydrophobic cement	S. K. Chopra & C. A. Taneja
78778	7-10-61	A method of making chocolate coloured bricks from alluvial soils	L. C. Jain, P. C. Jain & E. S. Hira Lal
79388	20-11-61	A process for the manufacture of bloated clay aggregate designed by us as "Gaylite" from the silt deposited by the river Hooghly	S. K. Chopra & Kishan Lal

1962

82303	18-5-62	A guide for making holes with augers	Subhash Chandra & A. K. Deb
85447	4-12-62	Heat flow transducer	M. L. Gupta

1963

91411	20-12-63	A new soil sampler	A. K. Deb & V. S. Aggarwal

National Botanic Gardens, Lucknow

1957

59418	19-1-57	Isolation of keto-steroids from *Lantana camara* Linn	V. N. Sharma & K. N. Kaul

1960

72408	28-6-60	A process for the separation and isolation of the aromatic principles of *Abelmoschus moschatus* seeds	G. Misra, V. N. Sharma, C. R. Mitra & K. N. Kaul
72611	20-7-60	Automatic collection of atmospheric pollen and spores	P. K. K. Nair & K. N. Kaul
72851	3-8-60	A modified process for preferential separation of the non-fatty constituents and simultaneous purification of the seed lipids	Y. C. Awasthi, C. Mitra & K. N. Kaul

1962

82192	10-5-62	An apparatus for the automatic collection of atmospheric pollen and spores	P. K. K. Nair & K. N. Kaul

1963

87529	20-4-63	A process for separation and isolation of lecithin from *Pithecolobium dulce* seed	S. K. Nigam, C. R. Mitra & K. N. Kaul

1964

92976	26-3-64	Improvements in or relating to the isolation of trilauric or lauric acid from the fruits of *Einnamomium cecidodaphne* Meissn	Akhileshwar Singh, S. N. Srivastava, V. N. Sharma & K. N. Kaul

Indian Institute for Biochemistry and Experimental Medicine, Calcutta

92035	1-2-64	Method for the manufacture of new antibiotic called "Jawaharene."	Durlav Krishna Roy

National Chemical Laboratory, Poona

1948

39441	7-4-48	An enzymic method for the production of calcium gluconate	M. Damodaran, P. N. Rangachari & K. V. Ramakrishnan.

39442	7-4-48	An improved method for the manufacture of sorbose from sorbitol	M. Damodaran & S. S. Subramanian
40735	27-12-48	An improved method for the manufacture of sorbose from sorbitol	M. Damodaran & S. S. Subramanian

1950

42885	27-3-50	Preparation of modified oils from vegetable oils for use in paints and varnishes	J. S. Aggarwal, N. C. Budhiraja & P. G. Sharma
43149	18-5-50	Transformation of castor oil gel into a viscous liquid	J. S. Aggarwal & A. S. Gupta
43164	20-5-50	Improvements in or relating to the manufacture of coating compositions	J. S. Aggarwal & S. C. Sethi
43544	25-7-50	Preparation of modified glycerol phthalate alkyds	S. L. Kapur & K. K. Sarin
43827	28-9-50	Preparation of cation exchange resins	H. A. Shah & S. L. Bafna
43979	28-10-50	Improvements in and relating to the production of wrinkle finishes	S. L. Kapur & K. K. Sarin

1951

44359	2-1-51	Preparation of ion exchange resins and the uses thereof	H. A. Shah & S. L. Bafna
44736	8-3-51	A process for the manufacture of alpha and beta-kamlolenic acids and derivatives thereof from Kamala seed oil	J. S. Aggarwal, V. N. Sharma & S. C. Gupta
44737	8-3-51	Air drying wrinkle finish coating compositions	J. S. Aggarwal & P. G. Sharma
45116	7-5-51	Preparation of new bactericidal and surface-active quaternary ammonium compounds	M. Damodaran & C. Sivaraman
45117-18	7-5-51	Improved process of extracting oil from oil-bearing material	J. P. Varma
45547	24-7-51	Preparation of photographic emulsion from comparatively inert gelatine	K. P. Sinha
45583	30-7-51	Manufacture of high quality gelatine from indigenous sources of hides and skins	H. K. Joshi, M. M. Uppal & G. V. Potnis
45666	14-8-51	Manufacture of nicotine sulphate from tobacco or tobacco wastes	J. Gedeon & M. Goswami

1952

46713	13-2-52	Utilization of the seed oil of nim for the production of oleic acid, stearic acid, palmitic acid and/or 'stearin'	C. Mitra
46857	10-3-52	Cation exchange resins	H. A. Shah & S. L. Bafna

46945	24-3-52	Manufacture of saponins (commercial grade) from Indian soapnuts	J. Gedeon
46946	24-3-52	Improvements in or relating to the manufacture of saponins (commercial grade)	J. Gedeon
46947	24-3-52	Isolation and separation of bitter constituents from the trunk and/or root bark of nim	S. Bhattacherji & C. R. Mitra
46994	29-3-52	Extraction of nicotine and an extraction tower for the purpose	J. Gedeon
47179	26-4-52	Improvements in or relating to sugarcane wax	A. B. Kulkarni
47382	3-5-52	A process for the modification of cashewnut shell liquid	J. S. Aggarwal & H. H. Mathur
47439	9-6-52	A process for the manufacture of a mixed nitrogen-phosphorus fertilizer	G. T. Gadre & J. Gupta
47468	16-6-52	Resinous compositions suitable for cation exchange	H. A. Shah & S. L. Bafna
47766	28-7-52	Cation exchangers	S. L. Bafna & H. A. Shah
47802	4-8-52	Purification and refining of non-edible, non-drying and so-called medicinal oils such as Karanja, Polang and Nageswar	C. R. Mitra
47815	6-8-52	Liquid preparations such as paints or the like coating compositions	J. W. McBain & J. B. Pande
47816	6-8-52	Duplicating inks	J. W. McBain & J. B. Pande
47817	6-8-52	A process for the manufacture of sodium tripolyphosphate	G. T. Gadre, M. K. Gharpurey & J. Gupta
48275	21-10-52	Waterproofing of boards used for sound proofing purposes	N. V. C. Rao & J. B. Pande
48529 ante-dated to 13-2-52	2-12-52	A process for the thermal degradation of seed oil of nim (*Melia azadirachta, Melia indica*)	C. R. Mitra
48530 ante-dated to 13-2-52	2-12-52	Improvements in or relating to utilization and refining of the seed oil of nim (*Melia azadirachta, Melia indica*)	C. R. Mitra
48640	17-12-52	Preparation of starch from starch-bearing plant materials	M. Damodaran & I. Babbar

1953

49022	19-2-53	A latex composition particularly suited for can-sealing purposes	J. Ballabh & D. Raghunath
49033	20-2-53	Treatment of hides for production of gelatine or glue	F. A. Kincl & G. V. Potnis
49364	13-4-53	The manufacture of adhesive tapes	N. V. C. Rao

49510	6-5-53	Purification and refining of non-edible, non-drying and so-called medicinal oils, such as Karanja, Polang and Nageswar	C. Mitra
49851	6-7-53	Recovery of hydrochloric acid gas from unreacted chlorosulphonic acid in the manufacture of aromatic sulphonyl chlorides	C. G. Joshi, A. B. Kulkarni & R. C. Shah
49852	6-7-53	Manufacture of azo-dyestuffs from cashew-shell liquid derivatives	V. S. Pansare & A. B. Kulkarni
50483	19-10-53	Soft iodo-bromide positive emulsions	D. Chatterjee & J. S. Gujral
50758	3-12-53	A process for the preparation of modified alkyd resins	J. S. Aggarwal & P. G. Sharma
50926	26-12-53	Manufacture of nicotinic acid	G. D. Shah & R. C. Shah

1954

52014	27-5-54	Preparation of halogenated rubber	C. S. Ramakrishnan & D. Raghunath
52027	29-5-54	Composition for preparing cylindrical rolls from washed safety base cinematographic films	K. G. Mathur & A. M. Lele
52028	29-5-54	A cement composition for jointing safety base cinematographic films	K. G. Mathur & A. M. Lele
52112	11-6-54	Improvements in or relating to cast synthetic resins	H. A. Shah
52801	25-9-54	The production of a special gelatin solution suitable for use as a plasma substitute (plasma volume restorer or expander) by a new method	M. Damoderan & S. G. Singh
53414	24-12-54	Process of treating molasses to give a solid material and the use of the same in phenolic-type plastics	Arthur Ghosh

1955

53636	25-1-55	Improvements in or relating to coating compositions	K. K. Sarin & S. L. Kapur
54395	3-5-55	A process for the manufacture of active manganese dioxide suitable for dry batteries	U. C. Agrawala, N. R. Sanjana & J. Gupta
54713	13-6-55	Extraction of fluorine in a soluble form from alkaline earth fluorides	M. M. Singh & J. Gupta
54828	27-6-55	Process for the manufacture of triammonium phosphate	K. Seshadri & J. Gupta
54829	27-6-55	Process for the manufacture of an ammonium phosphate fertiliser from triammonium phosphate	K. Seshadri & J. Gupta

54867	2-7-55	A process for the manufacture of nicotine sulphate from tobacco and tobacco wastes	H. C. Bijawat, R. Razdan & G. V. Potnis
54959	18-7-55	An electrical device for double action on off control	S. L. Sastri
55171	12-8-55	Treatment of anacardic material such as cashew-nut shell liquid for use in electrical insulating varnishes	K. G. Thakar, & J. Gupta
55172	12-8-55	A process for the utilization of waste cinematographic films	K. G. Mathur & A. M. Lele
55546	5-10-55	Improvements in or relating to ion exchange materials	C. S. Ramakrishnan & N. R. Krishnaswamy
55504	30-9-55	A process for the preparation of long-chain unsaturated ketones & 1-ω ketodicarboxylic acids from the said ketones	K. K. Chakravarti & S. C. Bhattacharyya
55757	3-11-55	A process for the preparation of long-chain unsaturated ketones & 1-ω ketodicarboxylic acids from the said ketones	B. Menon, U. G. Nayak, R. K. Razdan, K. K. Chakravarti & S. C. Bhattacharyya

1956

56391	27-1-56	A process for the preparation of civetone dicarboxylic acid (8-keto-pentadecane 1 : 15—dicarboxylic acid)	U. G. Nayak, K. K. Chakravarti & S. C. Bhattacharyya
56725	5-3-56	A new process for the purification of selenium	D. N. Sen & J. Gupta
56724	5-3-56	A water dispersible DDT paste	K. V. N. Rao, S. P. Bhide, S. B. Kulkarni & A. B. Biswas
56726	5-3-56	Preparation of water dispersible DDT as an oil bound paste	-do-
57541	7-3-56	A process for the preparation of dihydro jasmone	R. K. Razdan & S. C. Bhattacharyya.
57888	16-7-56	Improvements in or relating to the production of hydroxy, alkoxy or aryloxy substituted aryl alkyl ketones	J. L. Bose & R. C. Shah
58203	21-8-56	Improvement in or relating to the preparation of mush acid, 2-methyltridecane 1 : 13 dicarboxylic acid	K. K. Chakravarti & S. C. Bhattacharyya
58529	29-9-56	An improved process for the preparation of Beta-ionone	H. J. V. Krishna & B. N. Joshi
58868	13-11-56	A process for the preparation of azelaic acid semiester suitable for making civetone dicarboxylic acid	U. G. Nayak, K. K. Chakravarti & S. C. Bhattacharyya

1957

59295	5-1-57	A process for the production of alkali salts like alkali nimbidinates having medicinal properties from bitter constituents of nim	C. Mitra
59419	19-1-57	A process for the preparation of tridecane-1 : 13-dicarboxylic acid or its ester, suitable for the preparation of exaltone (cyclopentadecanone)	B. B. Ghatgey, U. G. Nayak, K. K. Chakravarti & S. C. Bhattacharyya
59457	24-1-57	A new process for preparation of fine dusts or wettable powders of insecticides such as DDT	(Miss) S. B. Kulkarni, P. S. Kolhatkar, A. B. Biswas, K. V. N. Rao & M. V. Kuber
59497	29-1-57	Production of porous polymer suitable for preparing cation-exchange resins	K. P. Govindan, R. N. N. Pandya & N. R. Krishnaswamy
59606	11-2-57	Preparation of cation exchange resin from porous cashew nut shell liquid polymer	N. R. Krishnaswamy, R. N. Pandya & K. P. Govindan
59608	11-2-57	Rigid filters	S. L. Kapur & R. N. Pandya
59853	9-3-57	Improvements in or relating to the preparation of costus root oil and the isolation of lactonic constituents therefrom	G. R. Kelkar & S. C. Bhattacharyya
59927	19-3-57	A process for the preparation of pentadecane-1 : 15-dicarboxylic acid or its ester suitable for the preparation of dihydrocivetone	U. G. Nayak, K. K. Chakravarti & S. C. Bhattacharyya
60555	20-5-57	Production of liquid rubber	Uma Shankar
60826	18-6-57	Improvements in or relating to the production of hydroxy, alkoxy or aryloxy substituted deoxybenzoins and particularly of deoxyanisoin	J. L. Bose & R. C. Shah
61585	30-8-57	A process for the manufacture of an ammonium phosphate-sulphate fertiliser	J. Gupta, K. Seshadri, J. Lobo & M. N. Rao
62159	31-10-57	Compositions having newly discovered medicinal properties from bitter constituents of nim	C. Mitra
62302	18-11-57	A process for the preparation of 1-ω-keto-dicarboxylic acid (or ester) suitable for the preparation of civetone and dihydrocivetone	K. K. Chakravarti & S. S. Bhattacharyya

1958

62890	20-1-58	A new process for the production of 4-hydroxy coumarin and its derivatives	V. R. Shah, J. L. Bose & R. C. Shah

63083	10-2-58	A new method for the preparation of 4-hydroxycoumarins	V. R. Shah, J. L. Bose & R. C. Shah
63736	15-4-58	A liquid-liquid extraction procedure for the separation of niobium-tantalum oxide mixtures	B. Sharma & J. Gupta
64366	12-6-58	Developments in or relating to the production of oils and fats having materials for detecting their adultration and preservation against spoilage	B. S. Joshi
64958	14-8-58	Improvements in or relating to polishing compositions	S. M. Shah, V. K. Hinge, V. V. Mhaskar & R. C. Shah
64959	14-8-58	A process for the preparation of dihydrojasmone	J. H. Amin & S. C. Bhattacharyya
65440	6-10-58	A process for the extraction of wax from sisal waste	S. M. Shah, V. K. Hinge, V. V. Mhaskar & R. C. Shah
65542	17-10-58	Improvements in or relating to the production of foundry core oil	R. P. Varma
65543	17-10-58	A process for the preparation of ω-dicarboxylic acids and ω-hydroxy acids suitable for conversion to macrocyclic compounds	H. H. Mathur & S. C. Bhattacharyya
65777	12-11-58	A new process for the production of 4-hydroxycarbostyrils	V. R. Shah, J. L. Bose & R. C. Shah
65778	12-11-58	Improvements in or relating to the production of transdiethylstilbestrol dimethylether and allied stilbenes	C. G. Joshi, J. L. Bose & R. C. Shah
65976	1-12-58	Improvements in or relating to suspension polymerisation of vinyl monomers	R. M. Joshi & S. L. Kapur
65977	1-12-58	Rubber-base adhesive	Uma Shankar
66096	11-12-58	A process for the production of bacterial diastase by submerged culture	I. Babbar, R. M. Bakhi & M. C. Srinivasan
66194	22-12-58	Improvements in or relating to can sealing composition	D. Raghunath & S. L. Kapur

1959

66803	21-2-59	Improvement in or relating to the manufacture of pressure sensitive adhesive tapes	S. L. Kapur & B. R. Rao
66836	25-2-59	Manufacture of ethylene dichloride	S. C. Banerjee, S. L. Phatak, M. U. Pai & L. K. Doraiswamy
66966	9-3-59	An improved process for the manufacture of porous rigid filters (Addition to 59608)	S. L. Kapur & R. N. Pandya
67490	28-4-59	Improvements in or relating to the preparation of adhesive tapes (Addition to 66803)	S. L. Kapur & B. R. Rao

67513	29-4-59	Improvements in or relating to the separation of niobium and tantalum from each other by liquid extraction	B. Sarma & J. Gupta
67932	5-6-59	Improvements in or relating to the process of separation and isolation of the physiologically active principles of nim oil. (*Melia indica*)	C. Mitra
68611	3-8-59	A new device for generating electrical power from the atmosphere	A. U. Momin
69062	14-9-59	Improvements in or relating to ferro-electric ceramic materials	V. B. Tare, A. P. B. Sinha & A. B. Biswas
69620	9-11-59	A process for the production of cellular rubbers and plastics	R. G. Gokhale & U. Shankar
69621	9-11-59	Chlorinated alkyl-aryl phenols as pesticides	B. C. Subba Rao & S. C. Sethi

1960

70318	8-1-60	Developments in /or relating to the production of oils and fats having materials for detecting their adulteration	B. S. Joshi
70319	8-1-60	Improvement in or relating to the process of preparing n-methyltaurine	G. P. Thakar & B. C. Subba Rao
70670	8-2-60	Improvement in or relating to the controlling of water evaporation for conserving water in lakes & reservoirs	(Miss) S. B. Kulkarni, M. K. Gharpurey, Noshir R. Sanjana, A. V. Deo, K. O. Abraham& B. C. Subha Rao
70889	26-2-60	A process for the production of graft co-polymers from natural rubber	C. C. Menon & S. L. Kapur
71063	14-3-60	Production of bacterial protease by submerged culture	I. Babbar, V. K. Powar & V. Jagannathan
71092	17-3-60	A process for the manufacture of citric acid	M. R. R. Raghavendra Rao & J. R. Vakil
71190	24-3-60	Preparation of anion exchange resins	N. R. Krishnaswami, K. P. Govindan & B. D. Dasare
71754	12-5-60	Surface active agents from cashewnut shell liquid	S. C. Sethi, (Miss) S. B. Kulkarni & B. C. Subha Rao
72425	30-6-60	A direct process for preparing the chlorides of barium and strontium from their sulphate minerals	S. H. Iqbal, J. Lobo & J. Gupta
73702	13-10-60	A process for the preparation of cyclopentadecanolide (exaltolide)	V. V. Dhekne, B. B. Ghatge & S. C. Bhattacharyya
74356	5-12-60	Preparation of insoluble reaction products of polystyrene for use as cation exchange materials	K. P. Govinda & N. R. Krishnaswamy

74451	12-12-60	Preparation of covering materials from anacardic materials	D. Raghunath, N. P. Suryanayana & N. K. Krishnaswamy

1961

75699	13-3-61	Improvements in or relating to the conversion of total bile acides into lithocolic acid	P. N. Rao
76017	30-3-61	Solvents and heat exchange liquids from cashew nut shell liquid	S. C. Sethi, L. K. Doraiswamy & B. C. Subha Rao
77080	9-6-61	A process for the preparation of ambrettolide	S. D. Subnis, H. H. Mathur & S. C. Bhattacharyya
77081	9-6-61	Improvements in or relating to the preparation of polyamide compounds and their compositions as anti priming agents in steam generators	K. D. Pathak & B. C. Subha Rao
77224	19-6-61	Synthetic esters as speciality lubricants for low temperature performance and particularly for the lubrication of clocks and watches	K. D. Pathak & B. C. Subha Rao
77225	19-6-61	A process for the preparation of beta ionone from pseudoionone	B. N. Joshi, K. K. Chakravarti, S. C. Bnattacharyya & R. C. Shah
77713	20-7-61	A process for the production of 5-keto-D-gluconic acid	I. J. Babbar, M. C. Srinivasan, M. G. Vartak & V. Jagannathan
78216	25-8-61	A process for the production of 3-pentadecyl cyclohexanol from cashew nut shell liquid	S. C. Sethi, D. D. Nanavati & B. C. S. Rao
79923	22-12-61	Manufacture of hexachloroethane	M. A. Bhat, M. Goswamy & M. U. Pai

1962

81071	5-3-62	Improvements in or relating to the recovery of nickel and fat from spent nickel hydrogenation catalyst	M. N. Sankarashanamurthy & A. B. Biswas
81072	5-3-62	Improvements in or relating to the preparation and production of catalysts for the hydrogenation of organic substances with particular reference to fatty oils	M. N. Sankarshanamurthy & A. B. Biswas
82189	10-5-62	Production of dextro tartaric and oxalic acids	H. G. Vartak, S. G. Patil & V. Jagannathan
82822	18-6-62	A process for the manufacture of high alpha cellulose dissolving grade pulps by alkaline pulping methods	G. M. Vyas, D. S. Bendale & M. B. Mahajan

83364	21-7-62	Manufacture of hexachloroethane	N. A. Bhat, M. Goswami & M. U. Pai
83716	14-8-62	Manufacture of nicotine sulphate from tobacco or tobacco wastes	M. Goswami, G. V. Potnis, V. Ramachandran & M. U. Pai
85148	16-11-62	A process for the preparation of dihydrojasmone and α-undecalactone (peach aldehyde)	S. G. Patnekar, B. M. Dubash, H. H. Mathur & S. C. Bhattacharyya
85446	4-12-62	Preparation of carboxylic cation exchange materials	N. Krishnaswamy, V. K. Indusekhar & B. D. Dasare
85789	24-12-62	Utilization of groundnut shells for the manufacture of high alpha cellulose dissolving grade pulp and vanillin	G. M, Vyas, D. S. Bendale, M. B. Mahajan, J. L. Bose, B. D. Modi, H. R. Sonawane & D. C. Bigg

1963

86541	18-2-63	A reactor for carrying out highly exothermic and explosive reactions particularly suited for chlorination of methane	S. P. Mukherjee, A. D. Deshpande, G. V. Potnis & M. U. Pai
86638	25-2-63	A process for the preparation and synthesis of 2-isopropenyl hexanols	Suryakumari Ramaswami S. K. Ramaswami & S. C. Bhattacharyya
86991	16-3-63	Preparation of polyurethane base printing rollers	N. D. Ghatge & S. L. Kapur
89004	20-7-63	A polycrystalline p-n junction photovoltaic solar cell	A. U. Momin & A. P. B. Sinha
90574	2-11-63	A process for the preparation of dl muscone	M. S. P. Ramachandran Nayar, H. H. Mathur & S. C. Bhattacharyya
90677	6-11-63	A new method for the preparation of formic acid	B. G. Vartak, S. G. Patil & S. V. Parenjpe
91412	20-12-63	Manufacture of 2-3 hydroxyuaphthoic acid from 2-naphthol in the presence of a dispersent	P. G. Phodtare, K. R. Sainivasan, B. A. B. Baliga, M. G. Kotasthane & L. K. Daraiswamy

1964

92977	26-3-64	Improvements in or relating to the manufacture of hexachloroethane	S. P. Mukherjee, M. Goswami, S. Sorendarajan, N. Sadasivan, R. N. Sen & L. K. Doraiswamy

Central Drug Research Institute, Lucknow

1953

50339	25-9-53	Manufacture of physiologically active compounds from *Cissampelos pareira*, Linn. (*Menispermaceae*)	S. Bhattacherji, V. N. Sharma & M. L. Dhar

50340	25-9-53	Isolation of a new alkaloidal constituent from *Cissampelos pareira* Linn, (*Menispermaceae*).	S. Bhattacherji, V. N. Sharma & M. L. Dhar

1954

52710	10-9-54	A process for the isolation of the alkaloids of *Rauwolfia serpentina* Benth	V. N. Sharma & M. M. Dhar
53199	23-11-54	A process for the isolation of alkaloids of *Rauwolfia densiflora* Benth	M. M. Dhar, S. Bhattacharji & M. L. Dhar

1956

58870	13-11-56	A process for the isolation of the cardioactive glycosides of digitalis	M. M. Dhar, N. M. Khanna & M. L. Dhar

1957

59265	2-1-57	An improved method for the isolation of psoralen-isopsoralen from dried fruits of of *Psoralea corylifolia*	S. Bhattacharji & M. L. Dhar
59266	2-1-57	A method for the isolation of psoralen—isopsoralen mixture from the seeds of *Psoralea corylifolia* (babchi)	S. Bhattacharji & M. L. Dhar
59455	24-1-57	A process for the preparation of a protein hydrolysate for oral use	C. R. Krishna Murti & V. Verma
60210	16-4-57	A process for the treatment of rice bran for the preparation of a tocopherol rich oil, a vitamin B complex concentrate & inositol for medical use	C. R. Krishna Murti & L. V. Khanna
60827	18-6-57	The isolation of a therapeutically active antibiotic & antiviral principle from *withania somnifera* (solanaceae)	P. A. Kurup
60866	24-6-57	A process for the preparation of an adsorbent clay from alluvial soils like Chick in Mitti for the recovery of vitamin B_2 (Riboflavin) from natural sources or fermented products	S. C. Agarwala & T. Sen
61772	18-9-57	A method for the isolation of psoralen-isopsoralen mixture from the seeds of *Psoralea corylifolia* (babchi)	S. Bhattacharji & M. L. Dhar
62497	13-11-56 7-12-57	A process for the fractionation & isolation of the individual cardioactive glycosides of digitalis	M. M. Dhar, N. M. Khanna & M. L. Dhar

1958

64957	14-8-58	A process for the preparation and isolation of gitalin and corresponding lanatoside from digitalis species	N. M. Khanna, M. M. Dhar & M. L. Dhar

65283	17-9-58	A process for the preparation of palatable yeast hydrolysate powder from distillery sludge	M. K. Rastogi & S. C. Agarwala

1959

67568	2-5-59	A process for the preparation of aqueous solution of water insoluble furocoumarins	J. Misra & B. Mukerji

1960

71945	26-5-60	Long acting oestrogens and other physiologically active compounds from stilboesterol and formaldehyde	M. M. Dhar & A. B. Kar

1961

76557	6-5-61	Process for synthesis of phenyltertiaryamino propionates and propanols	R. S. Kapil, S. N. Mehra, N. M. Vohra, J. D. Kohli & Nitya Anand

1962

84828	29-10-62	A process for the separation of psoralen and iso-psoralen from a mixture of psoralen-isopsoralen	R. V. Desai, S. Bhattacharji & M. L. Dhar

1963

87957	15-5-63	Production of levan and related polymers by fermentation using a locally isolated micro-organism	B. M. Gupta Ivan Clifford
88568	24-6-63	A process for the preparation of an anticonvulsant composition based on 3-b-N-dialkyl or arylaminoalkyl-quinazols-4-thiones and quinazol-4-ones	A. P. Bhaduri, N. M. Khanna & M. L. Dhar
89685	31-8-63	A process for the preparation of pancreatin from buffalo pancreas	A. C. Majumdar, R. Sen & P. D. Mathur

Central Electro-Chemical Research Institute, Karaikudi

1954

51189	3-2-54	Preparation of calcium gluconate by the electrolytic oxidation of glucose	B. B. Dey, H. V. Udupa & V. S. Menon
52394	24-7-54	A process for the electrolytic preparation of cuprous oxide	R. Viswanathan, S. Sampath, H. V. Udupa, A. Joga Rao & B. B. Dey
52631	27-8-54	A process for the electrolytic preparation of salicylaldehyde	H. V. Udupa & B. B. Dey

53195	23-11-54	Electrolytic preparation of para-aminophenol	G. S. Krishnamurthy, H. V. Udupa & B. B. Dey

1956

56532	13-2-56	A new technique for the electrolytic preparation of cuprous oxide	B. B. Dey, H. V. K. Udupa, S. Sampath & R. Viswanathan
57958	24-7-56	A new primary wet cell	V. Aravamuthan
58352	6-9-56	Electrolytic preparation of cuprous oxide	B. B. Dey, H. V. Udupa, S. Sampath & R. Viswanathan
58660	18-10-56	A new process for the production of aluminium hydroxychlorides	A. Joga Rao & B. A. Shenoy
58661	18-10-56	Improvements in or relating to the anodising of aluminium	A. Joga Rao & B. A. Shenoy
58662	18-10-56	Improvements in the technique of sensitising anodic films with blue printing solution	A. Joga Rao & B. A. Shenoy
58663	18-10-56	Production of designs in anodic films	A. Joga Rao & B. A. Shenoy
58730	25-10-56	Improved process for the production of opaque anodic films suitable for photographic reproduction	A. Joga Rao & B. A. Shenoy
59250	29-12-56	Electrowinning of lead from lead sulphate	B. B. Dey, V. Aravamuthan & P. R. Rajagopalan

1957

59712	22-2-57	Electrolytic separation of pure lead from high antimony lead alloys	B. B. Dey & P. R. Rajagopalan
59713	22-2-57	Production of pure manganese sulphate & high grade iron oxide from low grade manganese ores	T. R. Venkatasubramanian & V. Aravamuthan
59978	22-3-57	Electrowinning of antimony	B. B. Dey, V. Aravamuthan & P. R. Rajagopalan
60333	27-4-57	Improvements in or relating to the production of battery grade manganese dioxide from manganese ores	V. Aravamuthan & T. R. Venkatasubramanian
60732	8-6-57	Galvanic current generation in the utilisation of metal and alloy scraps containing copper	V. Aravamuthan
60733	8-6-57	Galvanic current generation in the utilisation of metal & alloy scraps containing lead	V. Arvamuthan

60734	8-6-57	Galvanic current generation in the utilisation of metal alloy scraps containing iron	V. Aravamuthan
60864	24-6-57	Improvements relating to the electrolytic preparation of salicylaldehyde	H. V. Udupa & B. B. Dey
60865	24-6-57	Improvements in and relating to the electrolytic reduction of m-dinitrobenzene to 2 : 4 diaminophenol	G. Srinivasan Subramanyan, H. V. Udupa & B. B. Dey
61801	20-9-57	An electrochemical process for the production of aluminium hydroxychloride	A. Joga Rao & B. A. Shenoy
62292	16-11-57	Electrowinning of zinc and recovery of elemental sulphur from zinc sulphide ores	V. Aravamuthan & R. Srinivasan
62293	16-11-57	Electrowinning of zinc by electrolysis of zinc chloride solutions	V. Aravamuthan & R. Srinivasan
62379	25-11-57	Improvements in or relating to the electrolytic preparation of manganic sulphate	H. V. Udupa, M. S. Venkatachalapathi & R. Ramaswamy
62426	29-11-57	A process for the oxidation of toluene to benzaldehyde.	H. V. Udupa, M. S. Venkatachalapathi & R. Ramaswamy

1958

63199	20-2-58	A new process for the prevention of the formation of adherent scales of calendria tubes of sugar factories	S. Ramachandram & S. R. Rajagopalan
65611	29-10-58	A filter for calibrating the wave length scales of optical instruments such as the spectrophotometer	Indra Sanghi & N. V. Parthasarathy
65646	29-10-58	Improvements in or relating to the production of manganese metal from manganese chloride baths with special reference to the utilisation of low grade manganese ores	V. Aravamuthan & S. Gopal
66109	11-12-58	Improvements in or relating to the production of magnesium metal	V. Aravamuthan & K. Venugopal
66148	17-12-58	Improvements in or relating to lead dioxide semiconductors in the preparation of rectifiers	H. V. Udupa
66175	19-12-58	A process for the oxidation of ortho, meta and para xylenes and mixed xylenes to the corresponding tolualdehydes	H. V. Udupa & M. S. Venkatachalapathi
66195	22-12-58	Preparation of lead dioxide electrodes for electrolysis	H. V. K. Udupa & K. C. Narasimhan

1959

67572	4-5-59	Improvements in or relating to the production of smooth, hard anodic coatings on aluminium	A. Joga Rao & B. Sambamurthy

67665	13-5-59	Improvements in or relating to the electrolysis of sodium sulphate solutions for the production of caustic soda and sulphuric acid	V. Aravamuthan
68377	13-7-59	Improvements in or relating to the protection of metallic surfaces against atmospheric corrosion	K. S. Rajagopalan & G. Ramaseshan
68869	27-8-59	Improvements in and relating to the manufacture of benzidine and substituted benzidines	H. V. Udupa, G. S. Subramanian & K. S. Udupa
69618	9-11-59	Improvements in and or relating to the preparation of perchlorates using dioxide anodes	H. V. Udupa & K. C. Narasimhan
70170	26-12-59	A new process for the prevention of formation of adherent scales on the bubble caps of alcohol rectifying columns	S. Ramachandran & S. R. Rajagopalan

1960

71978	30-5-60	Improvements in and or relating to the electrolytic reduction of m-dinitrobenzene to 2 : 4 diaminophenol	H. V. Udupa, G. S. Subramanian & K. S. Udupa
74680	26-12-60	Improvements in or relating to electrolytic derusting of corroded metal parts	K. S. Rajagopalan, N. Subramanyam & Y. V. P. R. Row

1961

79075	28-10-61	Improvements in or relating to the two stage electrochemical production of dialdehyde starch	H. V. Udupa, M. S. Venkatachalapathy & R. Ramaswamy
79212	6-11-61	Improvements in and or relating to the electrolytic reduction of m-dinitrobezene to 2 : 4 diaminophenol	H. V. Udupa, G. S. Subramanian & K. S. Udupa

1962

83365	21-7-62	Magnesium copper sulphate non-polarisable batteries	P. B. Mathur & N. J. Paul

1963

87994	16-5-63	Development of a solid rust-remover	N. Subramanian & N. Sundaram
88851	10-7-63	Improvements in or relating to the electrolytic reduction of benzoic acid to benzyl alcohol	H. V. Udupa, G. S. Subramanian, K. Natarajan & K. S. Udupa

90957	23-11-63	Preparation of porous carbon electrode using vegetable carbons for use in air depolarised cells	A. K. Abdul Waheed, K. V. N. Rao & K. S. G. Doss

1964

92721	11-3-64	Improvements in or relating to a new depolariser mix for use in alkaline primary cells	M. A. V. Devanathan, N. Ramaswamy & S. Venkatesan.

Central Electronics Engineering Research Institute, Pilani

1963

86639	25-2-63	An inexpensive chemical method of dicing a semiconductor slice for the manufacture of transistor family devices	K. S. Balain

Central Fuel Research Institute, Jealgora

1951

45138	10-5-51	A new method for the hydrolysis of starch or dextrin to glucose	R. P. Puri

1952

47446	10-6-52	Improvements in or relating to ion exchanger from coal, peat, lignite or the like	R. P. Puri & P. K. Banerjee
48385	7-11-52	New method of preparation of active carbons from coals and lignites	K. K. Roy, N. G. Basak & A. Lahiri

1953

49729	15-6-53	Improvements in or relating to the solvent extraction of coal	A. Lahiri & A. N. Basu
50173	29-8-53	A process for the utilization of low grade coal in cement manufacture	J. W. Whitaker

1954

53347	15-12-54	A process for production of a new type of fertilizer & soil stabilizer from coal, lignite, peat or the like	Adi Nath Lahiri & P. N. Mukherjee

1955

53527	12-1-55	An improved process for the production of humic acid from coal or lignite	P. N. Mukherjee, A. K. Das Gupta, A. N. Basu & A. Lahiri
53607	20-1-55	Improvements in or relating to the manufacture of chemicals for absorption of carbon dioxide	S. K. Bose, N. G. Basak & A. Lahiri

54264	14-4-55	A process for the preparation of new desiccants & dehumidifiers	R. P. Puri, K. Sarin & A. Lahiri
54960	18-7-55	A process for the production of phthalic anhydride	V. K. Mathur, C. S. B. Nair, A. N. Basu & A. Lahiri
55816	15-11-55	Improvements in or relating to the removal of sulphur from industrial gases	N. G. Basak, A. C. Majumdar & A. Lahiri
55817	15-11-55	Improvements in or relating to the removal of sulphur from industrial gases	N. G. Basak, A. C. Majumdar & A. Lahiri

1956

56581	22-2-56	Preparation of a resin from tar oil fractions	C. S. B. Nair, A. N. Basu & A. Lahiri
56582	20-2-56	A process for the manufacture of light constructional material such as hard boards laminates, blocks or the like	C. S. B. Nair, A. N. Basu & A. Lahiri
57013	9-4-56	A method for pre-treatment of non-coking, weakly coking & semi-coking coals for conversion to coking coals	A. Lahiri, A. N. Basu & S. N. Gupta

1957

61020	6-7-57	Continuous devolatilsation of fuels on a moving bed	A. Lahiri, S. K. Das Gupta, M. N. Das Gupta & A. K. Bose
61320	1-8-57	Improvements in or relating to the preparation of active carbon	K. K. Roy, N. G. Basak & A. Lahiri
61771	18-9-57	An improved process for the conversion of high sulphur coals into ion exchanger for water softening and the like	M. S. Iyengar, S. Huha, M. L. Beri & A. Lahiri
62336	21-11-57	A new process for the conversion of coal, coke or the like into ion-exchanger for water softening deionisation and the like	B. K. Mazumdar, S. K. Chakrabartty, S. N. Roy & A. Lahiri
62337	21-11-57	Improvements in the preparation of nitrogenous fertilizers from humic acids and the like	P. N. Mukherjee & A. Lahiri

1958

63685	7-1-58	A process for the manufacture of light constructional material such as hard boards, laminates blocks or the like	V. N. Badami, C. S. B. Nair, A. N. Basu & A. Lahiri
64523	2-7-58	A process for the manufacture of water resistant briquettes from lignite and the like	M. S. Iyengar, J. A. Subramanian & A. Lahiri
65890	21-11-58	A method for the conversion of higher tar acids to lower phenols	N. C. Saha, N. G. Basak & A. Lahiri

65891	21-11-58	A process for the conversion of coal tar or coal tar fractions to high speed diesel oil and gasoline	S. K. Bose, N. G. Basak, A. Ganguly & A. Lahiri
66095	10-12-58	A new method for production of diesel oil from coal tar and coal tar fractions	N. G. Basak, S. K. Bose, A. Lahiri & A. Ganguly
66197	22-12-58	A new method for the oxidation of cumene to α-cumylhydroperoxide	N. G. Basak, J. M. Sagar & A. Lahiri

1959

66293	2-1-59	A process for the production of anthraquinone	C. S. B. Nair, A. N. Basu & A. Lahiri
67262	4-4-59	Production of anion exchange material from coal	J. N. Bhowmik, P. N. Mukherjee & A. Lahiri
67468	24-4-59	Improvements in or relating to the preparation and isolation of isonicotins and nicotinic acids from the "beta-picoline cut"	A. Lahiri, H. S. Rao, A. R. Panicker & G. N. Kulshrestha
67476	25-4-59	A process for the conversion of coal and lignite into smokeless fuel	S. S. Choudhury, B. K. Mazumdar, S. K. Chakrabaratty & A Lahiri
67821	27-5-59	A process for the production of fungicides from coal tar	J. G. Saha, A. N. Basu & A. Lahiri
67822	27-5-59	A process for the extraction of phenols from coal tar oil fractions or coal hydrogenation oils	J. G. Saha, A. N. Basu & A. Lahiri
68680	8-8-59	Improvements in low temperature carbonisation practice as related to narrow continuous vertical retorts	K. Y. Shrikhande, H. C. Chakrabarti, V. V. Rao, N. N. Das Gupta, S. K. Das Gupta, S. Chatterjee & A. Lahiri
69617	9-11-59	A process for the extraction of phenols from coal tar oil and aqueous liquors	M. B. Roy, P. K. Banerjee, A. N. Basu & A. Lahiri
70151	23-12-59	Improvements in or relating to the less utilization of oxidised coal	A. K. Banerjee, P. N. Mukherjee & A. Lahiri

1960

73067	20-8-60	A process for the utilisation of Indian indigenous asbestos of amphibiole variety alone or in an admixture with chrysotile variety in the manufacture of asbestos cement sheets and similar materials	N. Biswas, S. N. Mukherjee, S. K. Majumdar, N. G. Banerjee, P. B. Dutta & A. Lahiri
73576	3-10-60	A simple specific gravity indicator for use in heavy medium coal washing	A. K. Chakravarti, A. G. Saha, P. Chatterjee, G. G. Sarkar & A. Lahiri

1961

75407	18-2-61	Improvement on Pat. No. 55816 relating to the process of desulphurising industrial gases	S. C. Ghosh, S. C. Varshney, S. Banerjee, N. G. Basak & A. Lahiri
76682	15-5-61	A process for the recovery and purification of anthracene, carbazole and phenanthrene and allied chemicals from coal tar fractions in highly concentrated or pure state	D. K. Sen, C. S. B. Nair, A. N. Basu & A. Lahiri
78015	10-8-61	Process for the extraction of tar acids	D. K. Sen, C. S. B. Nair, A. N. Basu & A. Lahiri
78389	7-9-61	A process for the manufacture of briquettes and moulded shapes from slack coal, coke breeze and fine metallic ores mixed with coke breeze	N. Biswas, T. V. Subramanian, M. S. Iyengar & A. Lahiri
79211	6-11-61	A method for the production of superior grade of (smoke points above 20 mm) kerosine and aviation turbine fuels from high aromatic content about 40 per cent middle distillates of crude oil	S. K. Bose, A. K. Ganguli, A. N. Basu, N. G. Basak & A. Lahiri

1963

86382	6-2-63	An improved process of coal flotation by use of grids	A. R. Roy, B. B. Konar, G. C. Sarkar & A. Lahiri
86823	6-3-63	A new process for the production of nitrogenous fertilizers and soil conditioner	P. N. Mukherjee, J. N. Bhaumik & A. Lahiri
90112	3-10-63	Preparation of anion-exchange resins from tar acids, phenols, cresols, and the like	J. N. Bhaumik, P. N. Mukherjee, S. K. Mallick & A. Lahiri
90907	21-11-63	A process for the recovery of elemental sulphur and/or production of sulphur dioxide from pyrites	A. Lahiri, N. G. Basak, G. Rao, N. Biswas, S. Banerjee, S. P. Chowdhury

1964

93032	31-3-64	An improved process for producing coal fertilizers	S. K. Banerjee, R. K. Chakrabarti, B. K. Bhattarya & D. K. Banerjee

Central Food Technological Research Institute, Mysore

1952

46714	13-2-52	A solvent extractor	Y. K. R. Rao
46793	27-2-52	Improvements in or relating to solvent extraction of oleaginous materials	Y. K. R. Rao

46794	27-2-52	Improvements in or relating to starch manufacture	V. Subrahmanyan, G. Lal, D. S. Bhatia, N. L. Jain & G. S. Bains
46995	29-3-52	Preparation of a malted milk product	M. R. Chandrasekhara, M. Swaminathan & D. S. Bhatia
47580	4-7-52	Preparation of a composite protein food	V. Subrahmanyan, M. Swaminathan, N. V. L. Rao & S. Kuppuswami
47902	20-8-52	Improvements in the preparation of groundnut milk, crud and products	V. Subrahmanyan, M. N. Moorjani & D. S. Bhatia
49719	30-12-52	Preparation of fructose from agave plant	M. Srinivasan & J. S. Bhatia

1953

49441	23-4-53	Improvements in the manufacture of fruit pulp in the form of sheets slabs or the like	G. S. Siddappa & B. S. Bhatia
49590	21-5-53	Improvements in or relating to the manufacture of fruit juice powder	G. S. Siddappa & Girdhari Lal
49838	2-7-53	Improvements in or relating to the roasting of cashew kernels	M. Prasad, N. S. Kapur & P. B. Mathur
49839	2-7-53	A process for the preparation of concentrated food products from groundnut kernels	B. H. Krishna & B. C. Sateyan
50122	20-8-53	Process for the deodorization and recovery of volatile principles from substances such as food materials	B. H. Krishna & S. K. S. Lakshmi Narayanan
50805	9-12-53	A new fruit product	N. L. Jain, D. P. Das & G. S. Siddappa

1954

51525	18-3-54	A process for the preparation of a malt food	M. R. Chandrasekahra, M. Swaminathan & V. Subrahmanyan
51575	27-3-54	A process for treatment of the agave plant	M. Srinivasan, I. S. Bhatia, B. H. Krishna & S. K. Lakshminarayana
52167	21-6-54	Treatment of tamarind pul for the extraction of tartaric acid and other useful components	B. H. Krishna, Y. S. Lewis, C. T. Dwarkanath, D. S. Johar & S. K. Lakshminarayana
53319	13-12-54	A process for improving the storage life of cashew kernels	Mangla Prasad & Prem Bihari Mathur

1957

59969	21-3-57	An Improved container for bulk packaging	N. V. R. Iyengar, W. B. Date, H. B. N. Murthy & V. Subrahmanyan

60867	24-6-57	Processing of banana pseudo-stem for use as cushioning material	N. V. R. Iyengar, B. Ananda Swamy & H. B. N. Murthy

1958

63659	7-4-58	An improved vacuum tester for canned foods	J. S. Pruthi, G. Lal & S. K. Lakshminarayana
64226	29-5-58	Preparation of predigested protein rich pasty products for fortifying and seasoning food preparations	V. Subrahmanyan, B. S. Lulla & D. S. Johar
64457	25-6-58	A process for the manufacture of malted milk powder	M. R. Chandrasekhara, M. N. Rao, M. Swaminathan, N. L. Lahiry, D. S. Bhatia & V. Subrahmanyan
64458	25-6-58	A process for the manufacture of malted milk beverage flavoured with cocoa	V. Subramanyan, M. R. Chandrasekhra, M. N. Rao, M. Swaminathan, N. L. Lahiry & D. S. Bhatia
64956	14-8-58	Preparation of predigested protein rich food powders	B. S. Lulla, D. S. Johar & V. Subrahmanyana
65138	3-9-58	Improvements in or relating to the manufacture of garlic powder	J. S. Pruthi, G. Lal & V. Subrahmanyan

1959

67931	5-6-59	A new flavouring substance from waste black pepper & common salt	T. N. Ramachandra Rao, C. T. Dwarkanath & D. S. Johar
69697	16-11-59	Improvements in or relating to spin pasteurizers for canned acid foods	J. S. Pruthi, P. K. Ramanathan & G. Lal
70049	15-12-59	Manufacture of vegetable milk powder	N. L. Lahiri, L. V. L. Sastry, S. R. Shurpalkar, M. R. Chandrashekhera, M. Swaminathan & V. Subramanyan

1960

70555	29-1-60	An air separator	Y. K. R. Rao
73978	4-11-60	An improved rumbler for the extraction of essential oils from tight-skinned citrus fruits	J. S. Pruthi, M. N. S. Vasudeva Rao, C. M. Parekh & G. Lal

1961

76315	3-5-61	Improvements in or relating to the conversion of oil seeds to a material particularly suited for aqueous extraction of protein and oil	V. Subrahmanyan

76516	3-5-61	Improvements in or relating to the process of manufacture of protein and oil from groundnuts and other oil seeds	V. Subrahmanyan
76517	3-5-61	Improvements in or relating to the production of manufacture of protein and oil from groundnuts and other oil seeds	V. Subrahmanyan
77449	3-7-61	A surgical suturing instrument	A. P. Jayaraj
79596	1-12-61	A process for the preparation of calcium based water soluble or dispersible proteins	M. Srinivasan

1962

81279	11-3-62	Improvements relating to the process for insect proofing of gunny bags for storage of food grain	S. K. Majumder, J. K. Krishna Rao & H. G. Sethumadhavan

1963

87671	29-4-63	A process for the direct solvent extraction of fresh coconut kernels for recovery of oil and edible meal	B. H. Krishna, V. B. Shanbhag, K. G. Ramaswamy & M. V. Rao
87815	7-5-63	Process for the preparation of box strapping from paper and indigenous fibres	P. Veerraju, B. Anandaswamy, N. V. R. Iyengar & A. Sreenivasan
88214	30-5-63	A new clinching device to seal fibre straps on packages	P. Veerraju
89536	22-8-63	Improvements in or relating to the manufacture of fruit and vegetable preserves	B. S. Ramachandra & S. S. Kalbag

1964

92273	14-2-64	A process for vacuum-puffing and dehydration of vegetables	K. E. Eapen
92274	14-2-64	A process for the production of moulded porous products from vegetables	K. E. Eapen
92276	14-2-64	A process for the production of puffed cereals	K. E. Eapen

Central Glass & Ceramic Research Institute, Calcutta

1946

36162	18-11-46	Improvements in or relating to the lathes particularly suited for glass working	A. Ram, B. V. J. Rao & Y. P. Varshney
36163	18-11-46	Improvements in or relating to the manufacture of double-walled or multi-walled glass flasks such as vacuum or thermos flasks	A. Ram, Y. P. Varshney & B. V. J. Rao

1949

41342	10-5-49	A process for the manufacture of foam glass	A. Ram, Y. P. Varshney, B. V. J. Rao & K. D. Sharma

1952

48419	12-11-52	Enamels for wire wound resistors	A. Ram, Y. P. Varshney & S. S. Verma
48667	20-12-52	Improvements in or relating to the utilization of waste mica for the manufacture of insulating bricks, slabs, tiles or the like	A. Ram & S. B. Roy

1953

49425	22-4-53	Enamels for wire wound resistors	Y. P. Varshney & S. S. Verma
49524	11-5-53	Foam glass	A. Ram & K. D. Sharma
49555	14-5-53	Boron free enamels	A. Ram, N. R. Srinivasan & S. S. Verma
49837	2-7-53	Production of pink enamels	A. Ram, N. R. Srinivasan & S. S. Verma

1954

51847	10-5-54	A process for the manufacture of copper ruby glass	A. Ram, S. N. Prasad & P. V. K. Vaish
52111	22-4-53	Enamels for wire wound resistores	Y. P. Varshney & S. S. Verma

1955

54394	3-5-55	Boron free ground coat enamels	Atma Ram & S. S. Verma
54433	9-5-55	Copper enamels	Atma Ram & S. S. Verma
55452	22-9-55	Manufacture of neutral glass	Atma Ram & S. Kumar
55453	22-9-55	Improvements in or relating to the manufacture of copper ruby glass articles	Atma Ram, S. N. Prasad & V. K. Vaish
55454	22-9-55	A process for wet grinding of mica	Atma Ram & S. B. Roy
55559	7-10-55	Modification of a process for the utilization of waste mica for the manufacture of insulating bricks, slabs, tiles or the like	Atma Ram & S. B. Roy

1956

56705	2-3-56	Low melting resistant glass compositions	A. Ram, S. N. Kumar & P. Nath

1957

59456	24-1-57	Improvements in or relating to the manufacture of hot face insulting bricks and blocks	Atma Ram , J. C. Banerjee P. K. Roy
60828	18-6-57	Manufacture of artificial porcelain teeth	Atma Ram, N. V. Raghunath & S. K. Chakrawarthy

1958

64225	28-5-58	Low melting resistant glass compositions (Addition to 56705)	A. Ram, S. Kumar & P. Nath
64716	21-7-58	Improvements in or relating to the manufacture of fire clay refractories	Atma Ram, J. C. Banerjee & N. B. Chatterjee

1959

66670	7-2-59	A device for the rapid classification of mica or like high frequency dielectrics on the basis of power factor	S. S. Mandal & S. B. Roy
69690	28-10-59	Improvements in or relating to paints	Atma Ram, S. B. Roy & H. D. Sarkar
69986	9-12-59	Improvements in or relating to aluminium paints	Atma Ram, S. B. Roy & H. D. Sarkar

1960

71333	5-4-60	Improvements in or relating to exterior house paints	Atma Ram, S. B. Roy & S. D. Sarkar
71467	18-4-60	Improvements in or relating to traffic paints	Atma Ram, S. B. Roy & H. D. Sarkar
71702	7-5-60	A process for decolorisation of glass	Atma Ram, S. K. Gupta & S. N. Prasad
72444	2-7-60	Antimony free white enamels	Atma Ram & S. S. Verma
78779	7-10-61	Formation of lustrous film on glass	Atma Ram, S. N. Prasad, K. P. Srivastava & V. K. Vaish

1962

81779	16-4-62	Process for enamelling of iron or steel directly with white or coloured vitreous enamels	Atma Ram, S. S. Verma & V. G. Upadhyaya

1963

87428	16-4-63	Improvements in or relating to the decolorization of mineral substances such as clay or sand	Atma Ram, S. Sen & S. K. Guha
90057	28-9-63	Improvements in or relating to electric incandescent filament lamps	Atma Ram, B. M. Bishai & Jagdish Prasad
90058	28-9-63	Improvements in or relating to focussing devices for projection lamps in paraboloidal or like shaped reflectors	B. M. Bishai & J. Prasad
90092	1-10-63	Improvements in or relating to fire retardment paints	S. B. Roy & D. B. Gupta

90113	3-10-63	Improvements in or relating to a process for the metallisation of non-conductors	S. B. Roy, S. S. Mandal & H. D. Sarcar
91430	23-12-63	Improvements in or relating to reconstituted mica	Atma Ram & S. B. Roy

Central Leather Research Institute, Madras

1950

43543	25-7-50	Process for improving the myrobalan liquor used in the myrobing process of East Indian tannage of skins and kips	K. S. Choudary & R. Selvarangan

1951

45088	2-5-51	Synthetic tanning materials	M. A. Ghani & A. L. S. Rao

1952

47597	7-7-52	A process for the preparation of basic aluminium sulphate for use as a tanning salt or in dyeing or the like	R. Selvarangan, M. A. Ghani & B. M. Das

1953

49815	29-6-53	A process for the production of improved tan liquors from vegetable tanstuffs	Y. Nayudamma & R. Selavarangan
50067	12-8-53	Synthetic tanning materials (syntans) for making leather	D. Mukherji & B. M. Das
50782	7-12-53	Improvements in or relating to tanning liquors	R. Selvarangan, M. A. Ghani & B. M. Das
50803	9-12-53	Synthetic tanning materials	N. Viswanathan & B. M. Das
50804	9-12-53	Synthetic tanning materials	N. Viswanathan & B. M. Das
50806	9-12-53	An improved process for the enzymic unhairing of skins and hides	S. Bose, W. M. Krishna & B. M. Das
50863	16-12-53	Synthetic tanning material	B. M. Das & D. Mukherjee
50872	17-12-53	Process for the manufacture of tanned skins	R. Selvarangan & B. M. Das
50873	17-12-53	Manufacture of basic aluminium chloride	R. Selvarangan & B. M. Das
50874	17-12-53	Manufacture of upholstery leathers	R. Selvarangan & B. M. Das

1954

51201	5-2-54	Manufacture of picking band leather	R. Selvarangan & B. M. Das
51250	13-2-54	A process for the manufacture of chrome vegetable tanning extract	Y. Nayudamma & T. S. Ranganathan
52013	27-5-54	A process of enzymic unhairing of skins and hides	S. Bose, W. M. Krishna & B. M. Das
52657	1-9-54	Preparation of synthetic tanning materials from gas tar	Y. Nayudamma
52670	2-9-54	Enzyme bates for leather manufacture	S. Bose & B. M. Das
52705	10-9-54	Modification of a process for the preparation of synthetic tanning materials from gas tar	Y. Nayudamma
52706	10-9-54	Modification of a process for the preparation of synthetic tanning materials from gas tar	Y. Nayudamma
52707	10-9-54	Modification of a process for the preparation of synthetic tanning materials from gas tar	Y. Nayudamma
52708	10-9-54	Modification of a process for the preparation of synthetic tanning materials from gas tar	Y. Nayudamma
52709	10-9-54	Modification of a process for the preparation of synthetic tanning materials from gas tar	Y. Nayudamma & N. Viswanathan
52798	25-9-54	A process for the preparation of synthetic tanning materials	N. Viswanathan & B. M. Das
52799	25-9-54	A process for the preparation of synthetic tanning materials	N. Viswanathan & B. M. Das
52834	30-9-54	A process for the treatment of vegetable tan liquors	R. Selvarangan & Y. Nayudamma
52835	30-9-54	Preparation of synthetic tanning materials from phenolic bodies	D. Mukherjee & B. M. Das
53196	23-11-54	Manufacture of upholstery leathers	R. Selvarangan & B. M. Das
53197	23-11-54	Process for the manufacture of tanned skins	R. Selvarangan & B. M. Das
53198	23-11-54	Manufacture of basic aluminium chloride	R. Selvarangan & B. M. Das
53270	6-12-54	Improvements in or relating to the manufacture of unadulterated east Indian tanned leathers	S. K. Mitra & B. M. Das

1955

53637	25-1-55	Preparation of synthetic tanning materials from rosin	A. Ganesan & Y. Nayudamma
53651	27-1-55	Improvements in or relating to synthetic tanning materials	D. Mukherjee & B. M. Das
53652	27-1-55	Improvements in or relating to synthetic tanning materials	D. Mukherjee & B. M. Das
53653	27-1-55	Improvements in or relating to synthetic tanning materials	D. Mukherjee & B. M. Das
53798	14-2-55	Improvements in or relating to leather manufacture	A. I. Ganesan & B. M. Das
54040	16-5-55	Composition for testing wool	S. K. Mitra & B. M. Das
54998	21-7-55	An improved process for the production of enzyme bates for leather manufacture	S. Bose, S. C. Dhar & B. M. Das
55768	7-11-55	A process for arresting the fermentation of vegetable tanliquors	Y. Nayudamma & J. B. Rao
55818	15-11-55	Manufacture of gold and silver leathers	A. I. Ganesan
55819	15-11-55	Manufacture of gold and silver leathers	A. I. Ganesan

1956

56251	7-1-56	A curing agent for raw hides and skins	S. N. Sen, S. C. Nandy & B. M. Das
57886	16-7-56	A new curing agent for wet salting of hides and skins	S. C. Nandy, S. N. Sen & B. M. Das
59011	29-11-56	An improved process for the production of enzyme depilants and bates for leather manufacture	S. Bose, S. C. Dhar & (late) B. M. Das

1957

59607	11-2-57	Manufacture of basic aluminium chloride	R. Selvarangan & (late) B. M. Das

1958

64354	12-6-58	A process for the production of an enzyme product for use in leather manufacture as a depilant or for the preparation of bates	S. Bose & S. C. Dhar

1959

66298	2-1-59	A new process for the manufacture of latex cement for leather	G. S. Rama Iyer & Y. Nayudamma

1963

87434	16-4-63	Acid washing, scouring, bleaching and softening of tannery goat hair, wool, buff and camel hair	S. K. Barat
87435	16-4-63	Dyeing of wool, hair and other keratinous fibres into a fast non-bleeding jet black shade	S. K. Barat
90469	23-10-63	Processing of day ready to wet sausages casings from cattle, goat, pig and sheep	S. K. Barat

National Metallurgical Laboratory, Jamshedpur

1951

45010	23-4-51	A process for the recovery of beryllium oxide	T. Banerjee & P. B. Chakravarty
45150	12-5-51	A process for the recovery of beryllium oxide (cognate with Patent No. 45010)	T. Banerjee & P. B. Chakravarty
45565	26-7-51	Improvements in or relating to brass plating	T. Banerjee & S. K. Ray
45579	30-7-51	Improvements in or relating to metallization of non-conductors	T. Banerjee & H. K. Chakrabarty

1952

47401	3-6-52	Chemical polishing of aluminium	S. S. Bhatnagar & B. R. Nijhawan
47982	2-9-52	An improved process for the electrolytic production of high purity manganese dioxide	T. Banerjee & H. K. Chakrabarti
48342	30-10-52	A method for the regeneration of the spent liquid from electrolytic manganese and electrolytic manganese dioxide baths	T. Banerjee & R. Manocha
48499	26-11-52	A method for the utilization of manganese ore for the production of pure manganese sulphate and the regeneration of the sulphate spent liquid from electrolytic manganese and manganese dioxide baths	T. Banerjee & B. Sen

1953

49355	10-4-53	An improved process for the production of electrolytic manganese metal	T. Banerjee, H. K. Chakrabarty & N. Dhananjayan

1954

51524	18-3-54	Improvements in or relating to the electroplating of metals on aluminium or its alloys	T. Banerjee & D. S. Tandon

51625	5-4-54	A process for the concentration of manganese ores high in iron	G. V. Subramanya Iyer & P. I. A. Narayanan
52335	14-7-54	Preparation of aluminium silicon alloys	R. M. Krishnan, M. N. Khanna, A. B. Chatterjee & B. Nijhawan
53390	21-12-54	An improved method for the production of manganese sulphate from manganese ores and its application for the regeneration of spent electrolytic manganese sulphate bath	P. P. Bhatnagar & T. Banerjee

1955

54676	9-6-55	An improved method for the preparation of metallic iodides, particularly titanium tertraiodide	P. P. Bhatnagar & R. A. Sharma
55289	27-8-55	A process for the hot-dip aluminizing of ferrous materials	A. N. Kapoor, A. B. Chatterjee & B. R. Nijhawan

1956

57884	14-7-56	Improvements in or relating to magnesium silicate refractories and use of the same	R. Singh, V. K. Moorthy & P. C. Sen
57887	16-7-56	Improvements in or relating to basic refractories and use of the same	R. Singh, V. K. Moorthy & P. C. Sen
57938	20-7-56	Aluminising of iron and steel	M. N. Khanna & B. R. Nijhawan
58244	25-8-56	An improved method for upgrading ferruginous ores, particularly separating iron from ilmenites	P. P. Bhatnagar & T. Banerjee
58353	6-9-56	Modification of a process for the electroplating of metals on aluminium or its alloys	T. Banerjee & D. S. Tandon
58553	4-10-56	Improvements in or relating to mullite refractories from kyanite	Rabindar Singh & H. P. S. Murthy
58869	13-11-56	Refractory compositions comprising graphite and silicon carbide	T. V. Prasad, H. P. Srinivasamurthy & Rabindar Singh

1957

61978	12-10-57	Nickel free chromium manganese nitrogen stainless steel (Type 1)	B. R. Nijhawan, P. K. Gupta, S. S. Bhatnagar & B. K. Guha
61979	12-10-57	Nickel-free chromium-manganese-nitrogen stainless steel (Type 2)	B. R. Nijhawan, P. K. Gupta, S. S. Bhatnagar & B. K. Guha

61980	12-10-57	Nickel-free chromium-manganese-nitrogen stainless steel (Type 3)	B. R. Nijhawan, P. K. Gupta, S. S. Bhatnagar & B. K. Guha
61981	12-10-57	A process for making completely stabilized dolomite refractories	M. R. Rao, P. C. Sen & H. V. B. Rao
62338	21-11-57	An improved method for producing nitrided manganese	T. Banerjee, P. P. Bhatnagar & M. K. Gupta
62352	22-11-57	Refractory compositions comprising graphite and alumino silicate materials and glazes to render such compositions resistant to oxidation	T. V. Prasad & H. P. Srinivasamurthy

1958

62938	25-1-58	A process to produce dense carbon aggregates from carbonaceous materials of varied volatile contents	H. P. Srinivasamurthy & P. Prabhakaram
63904	30-4-58	A process for recovering zirconium dioxide from zircon	P. B. Chakravarti & T. Banerjee
65230	13-9-58	Improvements in or relating to hot-dip aluminising of steel	S. M. Arora, P. K. Gupta & B. R. Nijhawan
65231	13-9-58	An improved method for the production of chromium-manganese alloys by alumino thermic reaction	R. A. Sharma & P. P. Bhatnagar
65556	24-10-58	A process for electrolytic production of iron-chromium alloys from chromite ore	P. B. Chakravarti & T. Banerjee
65610	29-10-58	Improvements in or relating to the production of chemically bonded metal clad or unclad basic refractories	R. S. Mathur & H. V. B. Rao
65696	3-11-58	Production of carbon pastes for use in the continuous soderberg electrodes	P. Prabhakaram & H. P. Srinivasmurthy

1959

67871	1-6-59	A method for the manufacture of porous bronze bearings	S. Ranganathan
68171	26-6-59	Compositions and methods of making welding flux	M. R. Rao, M. V. Naidu & H. V. Bhaskar Rao
68174	26-6-59	Refractory compositions containing non-refractory chrome ore and refractory products made therefrom	M. R. Rao, N. V. Naidu & H. V. Bhaskar Rao
68401	15-7-59	A pneumatic or such other forge hammer adapted for the manufacture of bricks or blocks out of ceramic mixes	H. V. Bhaskar Rao, H. P. Srinivasmurthy & R. C. Verma

1961

76415	27-4-61	Improvements in or relating to the modification of aluminium base alloys containing silicon	S. S. Bhatnagar, P. K. Gupte, B. R. Nijhawan, & G. G. Nair
76997	5-6-61	Improvements in or relating to the production of copper powder by electrolytic process	S. R. Ranganathan
79597	1-12-61	Improvements in a continuous vertical counter current solids gas reactor	M. J. Shahani
79598	1-12-61	An improved device for the continuous vapour phase degreasing of metallic wire and strip	M. J. Shahani

1962

81402	26-3-62	Improvements in or relating to electro-deposition of metals, particularly manganese, by direct current electrolysis of aqueous solutions containing metal ions	T. Banerjee & N. Dhananjayan
81403	26-3-62	Improvements in or relating to devices for the conversion of pig-irons into high grade steels	M. J. Shahani & Upkar Singh
82191	10-5-62	An improved jacketted electrolytic cell for the electro-deposition of metals and metallic oxides in general and manganese dioxide in particular	M. J. Shahani & T. Banerjee
82446	26-5-62	An improved melt-pot and furnace for the continuous hot dip aluminizing of steel strip and wire	M. J. Shahani & P. K. Gupte
83651	10-8-62	Improved dross shield	M. J. Shahni
83652	10-8-62	Improvements in or relating to magnesite refractories	M. R. Rao, A. Dutt, P. C. Sen & H. V. B. Rao
83968	3-9-62	A method for reconditioning the coated magnesium powders	V. S. Sampath, G. Basak & P. P. Bhatnagar
84670	19-10-62	Improvements in or relating to electrolytic cells	N. Dhananjayan, H. K. Chakrabarti, T. Banerjee & R. C. Verma

1963

91134	4-12-63	Improvements in or relating to a precision temperature controller for use with electric resistance furnaces up to 1600°C.	K. P. S. Kumar & A. P. Chowdhury

1964

91827	21-1-64	Improvements in or relating to an apparatus for automatically recording progressive changes in weights with special reference to thermogravimetric determinations	A. P. Chowdhury, K. P. S. Kumar & H. P. Srivasamurthy
91828	21-1-64	Improvements in or relating to the preparation of sintered silver electrodes	P. B. Mathur & N. Karuppannan

Central Mining Research Station, Dhanbad

1959

69619	9-11-59	A mechanical area integrator for the measurement of the cross-sectional area of mine-road-way or the like	Md. Shamusuzzoha

1961

75820	18-3-61	An improved profilograph (area meter) for the measurement of the cross-sectional area of mine-airways and for recording the shape of the same	K. M. Kaiser
78780	7-10-61	An improved process for the preparation of carbon monoxide detector tubes	A. K. Ghosh, D. P. Rajwar & B. Baksi

1963

90238	11-10-63	A microscope eyepiece graticule for rapid determination of projected specific surface of particulate material	S. Guruswamy

Central Mechanical Engineering Research Institute, Durgapur

1962

80906	22-2-62	Improvements in or relating to the telephony communication system	M. Shamsuz Zoha

Indian Institute of Petroleum, Dehra Dun

1963

91085	2-12-63	A process for the disproportionation of alkyl benzene	G. S. Bhargava, Pierre Duhaut & Gerard Follain

National Physical Laboratory, New Delhi

1942

28990	21-8-42	Duplicating ink and a process for its preparation	(Miss) S. Ram

1949

41722	23-7-49	An arrangement for cleaning producer gas or the like	S. K. Das Gupta & M. L. Khanna
41723	23-7-49	An arrangement for cleaning producer gas or the like	S. K. Das Gupta & M. L. Khanna

1951

45725	25-8-51	An improved cooling apparatus	M. L. Ghai
45726	25-8-51	Improvements in or relating to airconditioning or cooling systems	M. L. Ghai

1952

46981	28-3-52	Solar cooker	M. L. Ghai
47347	23-5-52	A gas carburettor	M. L. Khanna & S. K. Das Gupta

1953

50574	29-10-53	A magnetic fluid for crack detection	K. C. Srivastava

1954

52711	10-9-54	An electronic voltage regulator for shunt wound and compound-wound D. C. generators	J. Mahanty & A. N. Prasad
53369	17-12-54	Apparatus for concentrating solar energy	A. L. Gardner
53372	20-12-54	Improvements in or relating to the manufacture of ceramic capacitors	T. V. Ramamurti, C. V. Ganapathy & S. S. Mathur

1955

53462	3-1-55	High dielectric constant ceramics	T. V. Ramamurti, C. V. Ganapathy, S. S. Mathur & R. Krishnan
53528	12-1-55	A pyrochemical process for the metallisation of non-conductors	C. V. Ganapathy, T. V. Ramamurti & S. D. Sehgal
53608	20-1-55	Manufacture of ceramic semi-conducting bodies of titanium dioxide	T. V. Ramamurti, C. V. Ganapathy, S. S. Mathur & R. Krishnan
53817	16-2-55	Manufacture of high dielectric constant ceramics	T. V. Ramamurti, C. V. Ganapathy & S. S. Mathur
54263	14-4-55	Improvements in or relating to the manufacture of titanium dioxide and for titanate ceramics	T. V. Ramamurti, C. V. Ganapathy & S. S. Mathur

1956

56310	14-1-56	Device for testing the horse-power, pulling capacity and/or endurance of animals or moving bodies	V. Cadambe & C. R. Gupta
57935	20-7-56	Micro-film stand and copy-holder	V. Cadambe & Gurbux Singh
57936	20-7-56	A tunable magnetron	Amarjit Singh
58085	7-8-56	A sealing device for containers	C. R. Gupta
58382	11-9-56	A container closure device	C. R. Gupta
58597	8-10-56	A novel vehicle lamp device	C. R. Gupta
58757	29-10-56	An improved syphon	C. R. Gupta

1957

59658	16-2-57	An electric heater	C. R. Gupta
60120	5-4-57	Improvements in or relating to shaft and bearing mechanisms	C. R. Gupta
61774	18-9-57	A process for the manufacture of magnetic oxide of iron	K. C. Srivastava & O. P. Kulshreshtha
62261	12-11-57	A temperature sensitivec eramic composition having medium permittivity and retraceable characteristics	T. V. Ramamurti, C. V. Ganapathy, R. Krishnan, Aftab Ahmad & K. Vaitheswaran

1958

65780	12-11-58	Improvements in or relating to evaporated metal coatings particularly suiated for optical elements	P. Hariharan
66228	23-12-58	Improvements in or relating to wheel mounting mechanisms	C. R. Gupta & S. R. Mehra

1959

66295	2-1-59	Improvements in or relating to electronic receiving equipment using valves and transistors as linear circuit elements	M. V. Joshi & T. V. Ramamurti
66296	2-1-59	Improvements in and relating to radio receiving equipment using valves and transistors	M. V. Joshi & T. V. Ramamurti
66297	2-1-59	Improvements in or relating to transistorised receiving equipment	M. V. Joshi & T. V. Ramamurti
68055	17-6-59	Improvements in or relating to complex mixtures of sulphides and polysulphides commonly known as oxidising salts	O. P. Kulshreshtha & K. C. Srivastava

1960

71284	31-3-60	Process for electrolytic engraving or etching on metals or alloys thereof	K. C. Srivastava & O. P. Kulsreshtha
72264	20-6-60	Metal detector	C. S. Rangan & P. N. Taneja

1961

76683	15-5-61	Improvements in or techniques relating to filling of tubes	G. D. Joglekar, D. Sen & S. K. Kapoor

1962

83874	27-8-62	A process for the treatment of fish body oil	M. R. Verma, V. D. Puri & J. Rai
85787	24-12-62	Improvements in or relating to the manufacture of rods with core and shell of different materials	G. J. Joglekar & C. L. Verma

1963

87993	16-5-63	Improvements in or relating to soft ferrites	T. V. Ramamurti, C. V. Ganapathy, R. Krishnan, A. Ahmed & C. Govindaswamy
88569	24-6-63	A device for raising or releasing of weights	K. C. Srivastava & G. Singh
90906	21-11-63	Improvements in or relating to relay operated sequential switching devices	Ram Parshad

1964

92277	14-2-64	Improvements in or relating to process of production of ceramic rods for pyrolytic carbon resistors	Shiv Sharan & S. Rangarajan

Central Road Research Institute, New Delhi

1955

54074	19-3-55	Bitumastic jointing composition	S. Bagchi, C. G. Swaminathan & R. K. N. Iyengar

1956

56703	2-3-56	A reinforced bamboo structure	V. S. Goel
56704	2-3-56	A novel bearing	V. S. Goel

1958

64541	4-7-58	A reinforced bamboo structure like springs or beams	V. S. Goel
64554	7-7-58	A bearing	V. S. Goel

1962

85608	13-12-62	An anti-stripping agent for road binders	S. Bagchi

1963

87958	15-5-63	Expansion joint fillers from coconut pith, a waste product of the coir industry	T. N. Sharma, M. L. Puri & K. L. Sethi
90470	23-10-63	Improvements in or relating to the manufacture of lime-surkhi mixtures from surkhi manufactured in down-draught kiln	N. R. Srinivasan, M. L. Bhatia, R. K. Ghosh & S. R. Mehra

1964

92113	5-2-64	Improvements in or relating to bituminous binders and aggregates having anti-stripping properties for road and building construction work	S. Bagchi
92526	29-2-64	Improvement in or relating to pitch mastic composition	C. G. Swaminathan, B. C. Mazumdar & B. S. Mongia

Regional Research Laboratory, Hyderabad

1950

43437	8-7-50	Extraction of potassium hydroxide from felspar	E. R. Saxena, S. D. Datar & S. H. Zaheer

1951

46457	31-12-51	Improvements in or relating to the dehydration of caster oil	M. A. Sivasambham, S. A. Saletore & S. H. Zaheer
46161	8-11-51	Manufacture of white cement	E. R. Saxena, D. S. Datar & S. H. Zaheer
46416	22-12-51	Manufacture of levulinic acid	N. S. Rao & S. H. Zaheer

1953

48934	9-2-53	Improvements in or relating to the manufacture and purification of fatty acids	K. T. Achaya, S. A. Saletore & S. H. Zaheer

1954

51816	4-5-54	Recovery of fatty acids from cotton seed oil refining foots	K. T. Achaya, S. A. Saletore & S. H. Zaheer
52338	14-7-54	Process for the production of pesticidal compounds from turpentine oil	B. Bhusan & S. H. Zaheer

1955

55423	19-9-55	Improvements in or relating to the dehydration of castor oil	M. A. Sivasamban, S. A. Saletore & S. H. Zaheer

1956

58007	30-7-56	A process for the manufacture of active carbon from coals and lignites	S. H. Zaheer, D. S. Datar, T. L. N. Rao, R. Osmani, E. R. Saxena, K. N. Moorthy, Y. Venkatesham, M. G. Krishna, G. S. Chowdhury & K. G. Rangrez
58554	4-10-56	Process for reducing hygroscopicity and caking of ammonium nitrate fertiliser	Eshwar Raj Saxena, Dinkar Shripat Datar & S. H. Zaheer

1957

60863	24-6-57	Manufacture of 1-ethoxy 2-hydroxy propenyl benzene	S. Mahboob, U. D. N. Sastri, K. Ramachandran & S. H. Zaheer
62263	12-11-57	A process for the separation of tallow and tallow-like fatty acids into mainly saturated and mainly oleic acids	S. H. Zaheer, V. V. R. Subrahmanyan & K. T. Achaya

1958

63289	3-3-58	Improvements in or relating to vats for making hand made paper	G. S. Chowdhury, M. K. Chari, S. R. Amrit Rao, Saletore & S. H. Zaheer
63719	10-4-58	A process for the production of alkyl eugenols	S. Mahboob, C. C. Reddy, S. H. Zaheer
65779	12-11-58	A process for the production of hydrogen sulphide from gypsum	Razia Osmani, D. S. Datar & S. H. Zaheer

1959

66294	2-1-59	Improvements in or relating to electrode holders for manual arc welding	G. S. Chowdhury, G. C. G. Reddy, M. K. Chary & S. H. Zaheer

67664	13-5-59	Separation of soluble silica from alkaline solution	A. V. R. Rao, D. S. Datar & S. H. Zaheer
67779	23-5-59	A process for briquetting of non-caking coal slacks and carbonisation of briquettes to produce a strong coke	S. H. Zaheer, D. P. Agrawal, D. K. Rao & M. G. Krishna

1959

69325	14-10-59	A process for stabilisation of physostigmine (eserinum) sulphate	M. B. Naidu & S. H. Zaheer
69383	19-10-59	Refining of castor oil	V. P. Harigopal, K. T. Achaya, S. A. Saletore & S. H. Zaheer
69410	21-10-59	Improvements in or relating to the use of caster oil in surfce coatings (ricin varnishes)	M. C. Menon, J. S. Aggarwal & S. H. Zaheer
69698	16-11-59	A process for the manufacture of 2-methyl-3 ortho-tolyl-4 (3H) quinazolone and its salts	S. H. Zaheer & I. K. Kacker
69780	21-11-59	Improvements in or relating to production of citric acid from sugarcane molasses	B. S. Lulla & S. H. Zaheer
69781	21-11-59	Refining of cotton seed oil to light coloured products	V. P. Harigopal, S. R. Rao, K. T. Achaya & S. H. Zaheer
69782	21-11-59	Improvements in or relating to production of citric acid from saccharine materials	B. S. Lulla & S. H. Zaheer
70171	26-12-59	A process for the isolation of levulinic acid in its preparation from carbohydrate materials, such as molasses	C. N. Rao, C. C. Reddy, G. S. Sidhu, I. K. Kacker & S. H. Zaheer
70175	26-12-59	A method for the preparation of some 1, 2, 3, 4-tetrahydroquinolines	G. Thyagarajan, G. S. Sidhu & S. H. Zaheer

1960

71301	31-3-60	A process for preparation of cadmium sulphide	K. N. Moorthy, Y. Venkateshan, D. S. Datar & S. H. Zaheer
71321	4-4-60	Improvements in the process for the preparation of hydrazine compounds	E. R. Saxena, D. S. Datar & S. H. Zaheer
71322	4-4-60	A process for preparation of disinfectant grade creosote oil from primary tars	D. P. Agrawal, M. G. Krishna & S. H. Zaheer
71864	20-5-60	Improvements in or relating to the production of alpha-halotoluenes	S. H. Zaheer, Baldev Singh, Bharat Bhushan, S. Iqbal Ahmed, I. K. Kacker, V. Krishna moorthy & M. Zulfiqar Ahmed

71944	26-5-60	Improvements in or relating to the manufacture of phenylacetic acid	S. H. Zaheer, Baldev Singh, Bharat Bhushan, S. Iqbal Ahmed, I. K. Kacker, V. R. Krishnamoorthy & M. Z. Ahmed
72407	28-6-60	A process for the production of terpineol and terpin hydrate	S. J. Hasan, Bharat Bhushan & S. H. Zaheer
72869	4-8-60	Preparation of fattyacids	C. C. Ninan, S. R. Rao & S. H. Zaheer
73065	20-8-60	Improvements in or relating to the use of cashewnut shell liquid in surface coatings	M. A. Sivasamban, B. G. Murthy, J. S. Aggarwal, S. H. Zaheer (RRL) & P. G. Sharma (NCL)
73066	20-8-60	Preparation of road tar from primary tars	B. S. Narayan Rao, R. Vaidyeswaran, D. P. Agrawal, M. Ehsan, M. G. Krishna & S. H. Zaheer
74355	5-12-60	A process for refining cotton seed oil to obtain light coloured oil and soapstock	P. L. Narayana Rao, K. T. Achaya & S. H. Zaheer
74596	21-12-60	A process for the production of middle distillates such as illuminating fuels (kerosene substitutes), and diesel fuels from coal-tar and fraction thereof	M. G. Krishna, R. Vaidyeshwaran, B. N. Rao, M. J. A. Khan & S. H. Zaheer

1961

76414	27-4-61	Imports in the separation of silica from black alkaline from paper mills	A. V. Rajeswara Rao, Y. Venkateshan D. S. Datar, S. H. Zaheer (RRL) & M. Mohiuddin,(Orient Paper Mills)
76416	27-4-61	A process for the production of efficient fuel from liquid and anthracitic coals having high ash content	D. K. Rao, D. P. Agrawal, K. S. Rao, M. G. Krishna & S. H. Zaheer
76681	15-5-61	Preparation of new series organic compounds, (ante dt. to 26-12-59) viz 1 (dialkylamino-alkyl)-1, 2, 3, 4-tetrahydroquinolines	G. Thyagarajan, G. S. Sidhu & S. H. Zaheer
77226	19-6-61	New N-haloacyl-2-phenyl-ethylamine derivatives	P. B. Sattur, G. S. Sidhu, S. J. Hasan & S. H. Zaheer
77450	3-7-61	N-aminoacyl B-phenylethylamines	P. B. Sattur, G. S. Sidhu, S. J. Hasan & S. H. Zaheer

77451	3-7-61	Improvements in or relating to the production of terpineol	Bharat Bhushan, N. K. Sogani & S. H. Zaheer
77452	3-7-61	Improvements in or relating to the production of terpin hydrate	Bharat Bhushan, N. K. Sogani & S. H. Zaheer
77453	3-7-61	N (alkylaminoalkyl)-2-phenyle-thylamines	P. B. Sattur, G. S. Sidhu, S. J. Hasan & S. H. Zaheer
78418	11-9-61	Preparation of barium sodium chromate and barium potassium chromate	Razia Farooqi, D. S. Datar & S. H. Zaheer

1962

80742	14-2-62	A process for the production of diesel fuel from low temperature coal tar or fractions thereof	B. N. Rao, K. M. Murad, R. Vaidyeswaran, A. V. Ramaswami, M. G. Krishna & S. H. Zaheer
82190	10-5-62	Improvements in the process for the preparation of desiccant from gypsum	Mirza Raza Ali, M. A. Hai, D. S. Datar & S. H. Zaheer
83742	16-8-62	N-alkylaminoalkyl-benzylamines	Y. S. Sadanandam, P. B. Sattur, G. S. Sidhu & S. H. Zaheer
83743	16-8-62	New heterocyclic compounds of pharmacological interest	Y. S. Sadanandam, P. B. Sattur, G. S. Sidhu & S. H. Zaheer
83744	16-8-62	N-haloacyl-benzylamine derivatives	Y. S. Sadanandam, P. B. Sattur, G. S. Sidhu & S. H. Zaheer
83779	20-8-62	Novel heterocyclic amides and preparation thereof	G. Thyagarajan, G. S. Sidhu & S. H. Zaheer
83827	22-8-62	Novel N-haloacyl-1, 2, 3, 4-tetrahydroquinolines and preparation thereof	G. Thyagarajan G. S. Sidhu & S. H. Zaheer
84202	19-9-62	Heterocyclic compounds of pharmacological interest	P. P. Rao, P. B. Sattur, G. S. Sidhu & S. H. Zaheer
84827	29-10-62	N-haloacyl-1 : 2-diphenyl-ethylamines	P. P. Rao, P. B. Sattur, G. S. Sidhu & S. H. Zaheer
85860	31-12-62	2, 3-substituted 4(3H) quinazolones of pharmacological interest	P. B. Sattur, G. S. Sidhu & S. H. Zaheer

1963

85959	7-1-63	A reactor for carrying out high temperature reactions involving solids and gases	K. Seshacharyulu, Y. Venkateshan, D. S. Datar & S. H. Zaheer
86155	22-1-63	Substituted phenothiazines	(Kumari) S. B. Moray, G. Thyagarajan, G. S. Sidhu & S. H. Zaheer
86156	22-1-63	Amides of pharmacological interest	M. B. Husain, G. Thyagarajan, G. S. Sidhu & S. H. Zaheer

87849	8-5-63	Novel aralkyl-propionamides of pharmacological interest	Y. S. Sadanandam, K. Bhanumati, P. B. Sattur, G. S. Sidhu & S. H. Zaheer
87991	16-5-63	Preparation of saturated, unsaturated and hydroxy fatty alcohols by hydrogenolysis	A. J. Pantulu, K. T. Achaya, G. S. Sidhu & S. H. Zaheer
87992	16-5-63	Direct preparation of wax esters by fatty acids hydrogenolysis	A. J. Pantulu, K. T. Achaya, G. S. Sidhu & S. H. Zaheer
88213	30-5-63	Physiologically active amides derived from 1, 2-diphenylethylamines	P. P. Rao, P. B. Sattur, G. S. Sidhu & S. H. Zaheer
89325	8-8-63	N-haloacyl-2, 3-dihydro-1, 4-benzoxazones	(Kumari) S. B. Moray, M. Mazharuddin, G. Thyagarajan, G. S. Sidhu & S. H. Zaheer
90039	27-9-63	Novel heterocyclic amides and process for their preparation	(Kumari) S. B. Moray, M. Mazharuddin, G. Thyagarajan & G. S. Sidhu
90676	6-11-63	A process for the extraction and recovery of phenols from distillates of coal tar and mineral oil distillates containing phenols	S. Moinuddin Ahmed, Y. V. Subba Rao, R. Vaidyeswaran & G. S. Sidhu

1964

92275	14-2-64	Cinnamic acid amides of pharmacological interest	P. B. Sattur, K. Bhanumati & G. S. Sidhu
92278	14-2-64	N-Substituted 1, 2-diphenyl-ethylamine derivatives of pharmacological interest	P. P. Rao, P. B. Sattur & G. S. Sidhu

Regional Research Laboratory, Jammu & Kashmir

1958

64352	12-6-58	A method for the extraction of diosgenin from *dioscorea* tubers	V. Paul, K. L. Handa & I. C. Chopra

1963

91151	5-12-63	Isolation of a substance possessing powerful respiratory stimulant from *Prangos pabularia* Linn.	I. C. Chopra, K. S. Jamwal, K. L. Handa & V. P. Mahajan

1964

92978	26-3-64	Preparation of solasodine from *Solanium aviculare* leaves	Taj Singh, V. N. Vashist & K. L. Handa

Central Salt & Marine Chemical Research Institute, Bhavnagar

1954

53348	15-12-54	A process for removal of pink colour and offensive smell from lake bitterns	Mata Prasad, D. J. Mehta & R. K. Sapre

1955

54604	30-5-55	A process for the removal of pink colour and offensive smell from solid lake bitterns	Mata Prasad, D. J. Mehta & R. K. Sapre
54650	6-6-55	Process for the removal of pink colour from lake brines	Mata Prasad, D. J. Mehta & R. K. Sapre

1956

58243	25-8-56	A process for the separation of sodium sulphate from mixtures of sodium sulphate and sodium chloride	R. K. Sapre & S. D. Buch
58528	29-9-56	Manufacture of light basic magnesium carbonate	Mata Prasad, B. K. Shukla & D. J. Mehta

1957

60556	20-5-57	A new process for the manufacture of spherical crystals of alkali halides	G. I. Finch, B. K. Shukla & D. J. Mehta

1959

67461	24-4-59	Process for the manufacture of carnallite from sea bittern	K. Seshadri, G. D. Bhatt & C. J. Dave

1963

86383	6-2-63	Process of treating mixed salt for potash alum	K. Seshadri, G. D. Bhatt & J. R. Sanghavi

Delhi Laboratories

1942

28990	21-8-42	A duplicating ink and the process for its preparation	(Miss) Sosheila Ram
28974	7-8-42	Improvements in or relating to the degradation of proteinous materials	A. Ram, S. S. Bhatnagar & Karimullah
29051	21-9-42	Modification of a process for the conversion of bhilawan shell liquid to a non-vesicating drying product for the manufacture of lacquer varnishes, stoving enamels, waterproofing, electric insulating and plastic compositions, or like materials	S. Siddiqui & A. A. Khan
29128	27-10-42	A collapsible tube or the like container and a method of making the same	S. S. Bhatnagar & P. Prakash

29155	2-11-42	A process for the reclamation of rubber waste for producing substitutes of hard and soft rubber, vulcanite, ebonite, and composite moulding powders, adhesives, impregnating solutions and the like products	S. Siddiqui & A. A. Khan

1943

29374	19-2-43	Process and plant for the manufacture of phthalic anhydride	S. S. Bhatnagar, N. Ghatak & Karimullah
29400	3-3-43	Padding material from coconut coir	A. Ahmad, D. A. Basir, S. Bhatia & S. S. Bhatnagar
29412	16-3-43	Improvements in or relating to fluids used in hydraulic mechanism	J. S. Aggarwal, S. S. Bhatnagar & L. C. Verman
29842	26-7-43	Water detecting composition	A. Ram, V. Lezard & M. R. Verma
29938	28-8-43	A process for the conversion of bhilawan shell liquid to a non-vesicating drying product for the manufacture of lacquer varnishes, stoving enamels, water-proofing electric insulating and plastic compositions or like materials.	S. Siddiqui & A. A. Khan
29939	28-8-43	Improvements in or relating to rendering textile fabric non-inflammable and water resistant	A. Ram, S. S. Bhatnagar, Karimullah & C. A. R. Khan
29940	28-8-43	Improvements in or relating to rendering textile fabric non-inflammable and water resistant	A. Ram, S. S. Bhatnagar, Karimullah & C. A. R. Khan
29966	7-9-43	Preparation of resinous materials from the milky juice of plant Euphorbia tirucalli	A. Ram, S. S. Bhatnagar, N. L. Dutta, Karimullah & G. C. Smith
30072	15-10-43	An ice bag or like container and a method of making the same	S. S. Bhatnagar & P. Prakash
30196	15-11-43	A method of and composition for lining and seaming containers	S. S. Bhatnagar, Karimullah & G. S. Tewari

1944

30451	29-1-44	A process for the manufacture of sintered glassware	B. V. J. Rao
30502	8-2-44	An improved process of the degradation of keratinous materials or the like	S. S. Bhatnagar, A. Jogarao & L. C. Verman
30679	24-3-44	Improvements in or relating to the production of foam generating substances	S. S. Bhatnagar, A. Ram, A. Jogarao, Karimullah & L. C. Verman

30680	24-3-44	Improvements in or relating to the manufacture of containers, receptacles, hollow-ware or the like from resin impregnated laminations	S. S. Bhatnagar, A. R. Khan & L. C. Verman
31282	8-8-44	Improvements in or relating to the manufacture of moulding powders	S. S. Bhatnagar, A. Jogarao & L. C. Verman
31283	8-8-44	A sealing composition and method for sealing holes in metallic or other sheets, containers or the like	A. Ram, S. S. Bhatnagar & M. R. Verma
31595	28-10-44	Improvements in or relating to rendering paper water-proof, grease-proof and non-porous	Karimullah & G. S. Tewari
31877	28-12-44	Improvements in or relating to the manufacture of flux compositions for aluminium or its alloys	S. S. Bhatnagar & A. L. S. Rao

1945

32237	21-3-45	Improvements in or relating to the expulsion of the shell liquid from bhilawan or cashewnuts	S. Siddiqui & A. A. Khan
32352	7-4-45	Improvements in or relating to the extraction of rubber from cryptostegia	S. S. Bhatnagar, Karimullah & U. Shankar
32823	9-7-45	Improvements in or relating to the production of raised patterns or lettering on the surface of plastic moulded products	B. N. Sikka, G. Singh & L. C. Verman
32824	9-7-45	Improvements in or relating to the manufacture of containers, hollow-wax or the like articles from resin impregnated laminations	B. N. Sikka, G. Singh & L. C. Verman
32971	30-7-45	Improvements in or relating to the extraction of rubber from leaves of cryptostegia	S. S. Bhatnagar, Karimullah & U. Shanker
33059	11-8-45	Improvements in or relating to gas cleaning devices for use in conjuction with producer gas plants	S. K. Das Gupta, M. L. Khanna, K. A. Nair & L. C. Verman
33649	26-11-45	Isolation of new bitter principles from nim oil	S. Siddiqui & C. Mitra
33650	26-11-45	Separation of the bitter principles from nim oil and simultaneous refining of the oil	S. Siddiqui & C. Mitra
33651	26-11-45	Manufacture of new derivatives or subsidiary from the physiologically active bitter principles of nim oil	S. Siddiqui & C. Mitra
33786	14-12-45	Improvements in the working life of jute or cotton mill bobbins, textile shuttles or the like accessories made of wood	S. S. Bhatnagar, L. C. Verman, S. M. Karim & A. N. Nayer
33787	14-12-45	A method of adjusting watches and time pieces	L. C. Verman

1946

34040	24-1-46	Improvements in or relating to containers of the cigarette case type	G. Singh & L. C. Verman
34410	21-3-46	Manufacture of mosquito-repellant compositions	S. Siddiqui, C. R. Mitra & A. V. Subbaratnam
34692	26-4-56	Improvements in or relating to air separators for separating ground aggregate mass into different sizes	G. D. Joglekar
34766	4-5-46	Improvements in or relating to magnetic separators	S. D. Joglekar & L. C. Verman
34873	24-5-46	An improved apparatus for the expulsion of shell liquid from bhilawan and or cashew nuts	S. Siddiqui & A. A. Khan
34937	30-5-46	Improvements in or relating to coating composition for card-board containers	S. M. Karim & K. K. Sarin
34938	31-5-46	Improvements in or relating to depolymerization of rubber	S. Siddiqui, A. A. Khan & B. C. Mazumdar
35331	8-8-46	Manufacture or rubber sponges	A. A. Khan, B. C. Mazumdar & S. Siddiqui
35336	8-8-46	Improvements in or relating to food containers made of paper, card-board or fabric	S. M. Karim & K. K. Sarin
35337	8-8-46	Improvements in or relating to the coating of card board containers for rendering them suitable for packing non-alkaline watery solutions, inks or the like	S. M. Karim & K. K. Sarin
35338	8-8-46	Improvements in or relating to the manufacture of concentrated extract of pyrethrum	S. Siddiqui & A. V. Subbaratnam
35567	3-9-46	Improvements in or relating to preventing the deterioration of pyrethrinus and preserving the biological stability of pyrethrum preparations	S. Siddiqui, A. V. Subbaratnam & V. Sharma
35646	11-9-46	An improved air cleaning and crank case ventilation system for internal combustion engines	K. A. Nair & L. C. Verman
36073	11-11-46	Improvements in or relating to the production of cyclised rubber	Karimullah & U. Shankar
36074	11-11-46	Improvements in or relating to the production of chlorinated rubber	Karimullah & U. Shankar
36318	9-12-46	Improvements in or relating to the manufacture of rubber compounds for lining or sealing containers or for making dipped goods or the like	Karimullah, U. Shankar & G. S. Tewari

1947

38062	21-8-47	Improvements in or relating to the conversion of bhilawan shell liquid to a non-vesicating drying product for the manufacture of air-drying varnish compositions	S. Siddiqui
38063	21-8-47	Improvements in or relating to compositions and process for the manufacture of patent leather	S. Siddiqui & D. C. Dhar
38064	21-8-47	Improvements in or relating to the conversion of bhilawan shell liquid to a non-vesicating drying product for the manufacture of lacquer varnish, stoving, enamels, waterproofing or like materials	S. Siddiqui & D. C. Dhar

1948

40257	13-9-48	Improvements in or relating to manufacture of inks for stamping, printing, stencilling or like purposes	S. Siddiqui, J. S. Aggarwal & S. K. Mathur
40752	27-12-48	Conversion of bhilawan shell liquid to a non-vesicating drying product for the manufacture of lacquer varnishes, stoving enamels or water resistant and flame resistant paints	S. Siddiqui, K. K. Sarin & A. Singh

1949

41338	9-5-49	A plastic material from shellac and resinols like bhilawan shell liquid or cashew shell liquid	S. Siddiqui, K. K. Sarin & J. P. Varma
41339	9-5-49	Moulding powders from shellac and resinols like bhilawan shell liquid or cashew shell liquid	S. Siddiqui, K. K. Sarin & J. P. Varma
41340	9-5-49	Improvements in and relating to the production of moulding powders from shellac and bhilawan resins	S. Siddiqui, K. K. Sarin & J. P. Varma
41878	25-8-49	Manufacture of heat-insulating light-weight padding material for roofing boards or the like from agricultural waste	S. Siddiqui, K. K. Sarin J. P. Varma & P. Dayal

1950

43292	12-6-50	Improvements in or relating to the manufacture of emulsifying composition	K. K. Chakravarti & S. Siddiqui
43320	15-6-50	Manufacture of bituminous compositions for use as expansion joints or the like	S. Bagchee, B. C. Mazumdar & S. Siddiqui
43321	15-6-50	Improvements in or relating to the manufacture of bituminous jointing compositions	S. Bagchee, B. C. Mazumdar & S. Siddiqui

1951

44986	19-4-51	Synthetic tanning materials	S. Siddiqui & M. A. Ghani

Calcutta Laboratories

1940

27714	27-9-40	Process for improving the mechanical and physical properties of wood	S. S. Bhatnagar, L. C. Verman, S. M. Karim & G. D. Joglekar
27715	27-9-40	Improved process for the production of lubricating oils	J. S. Aggarwal, H. D. Chowdhury, S. N. Mukerji & L. C. Verman

1941

28002	8-4-41	A process for the conversion of bhilawan shell liquid to a non-vesicating drying product for the manufacture of lacquer varnishes, stoving enamels, water-proofing, electric insulating and plastic compositions or like materials	S. Siddiqui & S. K. Ranganathan
28003	8-4-41	A process for the conversion of bhilawan shell liquid to a non-vesicating drying product for the manufacture of lacquer varnishes, stoving enamels, water-proofing, electric insulating and plastic compositions or like materials	S. Siddiqui & S. K. Ranganathan
28004	8-4-41	A process for the conversion of bhilawan shell liquid to a non-vesicating drying product for the manufacture of lacquer varnishes, stoving enamels, waterproofing, and plastic compositions or like electric insulating materials	S. Siddiqui & A. Khan
28005	8-4-41	A process for the conversion of bhilawan shell liquid to a non-vesicating drying product for the manufacture of lacquer varnishes, stoving enamels, water-proofing, electric insulating and plastic compositions or like materials	S. Siddiqui & A. Khan
28135	18-6-41	A process for the preparation of depolarizing agent for dry cells	K. Subbaramaiah & L. C. Verman
28277	5-8-41	Improvements in or relating to laminated boards	S. S. Bhatnagar, C. A. R. Khan & L. C. Verman
28281	6-8-41	Improvements in or relating to laminated corrugated boards	S. S. Bhatnagar, C. A. R. Khan & L. C. Verman

28306	16-8-41	Improvements in plastic compositions	S. S. Bhatnagar & A. Ahmad
28307	16-8-41	A method of preparing a rubber composition for manufacturing artificial cork, stoppers, refrigerator pads, insulating materials and the like substances so manufactured	S. S. Bhatnagar & A. Ahmad
28376	22-9-41	Improvements in or relating to the degradation of proteinous materials	A. Ram, S. S. Bhatnagar & Karimullah
28424	10-10-41	Process for the conversion of cashew nut shell liquid to a drying product for the manufacture of lacquer varnishes, stoving enamels, water proofing, electric insulating and plastic compositions, and like materials	S. Siddiqui & A. A. Khan
28427	13-10-41	Improvements in or relating to containers, receptacles, utensils and the like	S. S. Bhatnagar, P. Prakash & L. C. Verman
28428	13-10-41	A process for obtaining resin from agricultural wastes such as bagasee and jute wastes, and the resin so obtained	S. S. Bhatnagar, P. Narain & G. S. Tewari
28563	17-10-41	A process for the transformation of castor oil gel into a soluble viscous liquid	S. K. Ranganathan & S. Siddiqui

Shri Ram Institute for Industrial Research, Delhi

1952

46575	24-1-52	A process for saccharifying cellulosic material particularly agricultural residues	N. R. Kuloor & K. Manivannan
46576	24-1-52	A process for saccharifying cellulosic material such as agricultural residues	N. R. Kuloor K. Manivannan

1953

49836	2-7-53	Manufacture of ether	V. V. Deshpande & N. R. Kuloor

1954

51958	22-5-54	Manufacture of ethylene dichloride	R. K. Bhatnagar, N. R. Kuloor & D. N. Daruvalla

1956

56322	17-1-56	An improved process for the manufacture of vinyl chloride from ethylene dichloride	R. K. Bhatnagar & N. R. Kuloor
56818	14-3-56	An improved process for the manufacture of vinyl chloride from ethylene dichloride	R. K. Bhatnagar & N. R. Kuloor
56935	28-3-56	Manufacture of ethylene dichloride	R. K. Bhatnagar, N. R. Kuloor & D. N. Daruvalla

57007	7-4-56	A process for the preparation of ethylene from ethyl alcohol	V. V. Deshpande, R. K. Bhatnagar, S. Venkataraman, N. R. Kuloor &. D. N. Daruvalla
58552	4-10-56	Improvements in or relating to thermal dehydrochlorination of ethylene dichloride	R. K. Bhatnagar & N. R. Kuloor
58756	29-10-56	Improvements in the manufacture of maleic anhydride	R. T. Tampy & I. K. Suri

1957

60921	27-6-57	Improvements in the method for manufacture of ether	V. V. Deshpande, A. Ramalingam & N. R. Kuloor
59835	7-3-57	An improved process for the production of shrink and crease proof finishes of cellulose textiles	N. B. Sattur, E. Syamalarao & V. B. Chipalkatti

1958

62751	6-1-58	Manufacture of cellulose carboxyalkyl ethers	C. D. Dhariyal & V. B. Chipalkatti
62939	25-1-58	Improvements in or relating to curing catalyst for the treatment of textiles materials with aminoplast resins	V. B. Chipalkatti, K. V. Ramalingam & N. B. Sattur
64353	12-6-58	Improvements in the manufacture of furan compounds	R. T. Thampy, K. Kathpalia & V. R. Nagarajan
65282	17-10-58	Improvements in or relating to crease and shrink proofing of cellulosic textiles	V. B. Chipalkatti, K. V. Ramalingam, N. B. Sattur & E. Syamalarao

1959

66886	2-3-59	Improvements in or relating to bonding agent particularly suited for the manufacture of abrasive articles	V. Nagarajan & R. T. Thampy
66953	6-3-59	Process for preparation of ethylene oxide	H. Ibrahim, V. V. Deshpande & N. R. Kuloor
67636	11-5-59	An improved process relating to thermal polymerization of unsaturated fatty acids	B. G. Sharma & R. K. Bhatnagar
68172	26-6-59	A new process for the preparation of crotonaldehyde	H. Ibrahim, V. N. Deshpande & N. R. Kuloor
68173	26-6-59	An improved process for the manufacture of ethylene dichloride	Satish Chander, R. K. Bhatnagar & N. R. Kuloor

69164	24-9-59	An improved process for the manufacture of maleic anhydride	B. S. Trehan, R. T. Thampy & N. R. Kuloor
69250	3-10-59	Improvements in or relating to the manufacture of abrasive articles	V. Nagarajan & R. T. Thampy
69369	19-10-59	A new bonding agent for the manufacture of abrasive articles cast and moulded articles or the like	V. Nagarajan & R. T. Thampy
70172	12-12-59	An improved process for or relating to manufacture of lower vinyl esters in general and vinyl aceate in particular	S. Ramanujam, R. K. Bhatnagar & N. R. Kuloor
70174	26-12-59	An improved process for the production of dimeric linoleic acids	Satish Chander & R. K. Bhatnager

1960

71169	22-3-60	Process for the manufacture of BB'-dichlorodiethyl ether	N. R. Kuloor, Kanti Kathpalia & C. D. Anand
71285	31-3-60	Improvements in the method for manufacture of acetaldehyde	J. K. Mahendra, V. V. Deshpande & N. R. Kuloor
71818	16-5-60	Improvements in or relating to the manufacture of sodium carboxy alkyl cellulose	V. B. Chipalkatti, S. K. Manivannan & H. R. Chipalkatti
71946	26-5-60	Improvements in or relating to a process for the manufacture of ethylene chlorohydrin	R. T. Thampy, N. R. Kuloor, (Mrs) Kanti Kathpalia & C. D. Anand
71979	30-5-60	An improved process for the manufacture of monoglycerides	R. K. Kochhar & R. K. Bhatnagar
74450	12-12-60	Improvements in or relating to the manufacture of maleic anhydride	H. S. Trehan & R. T. Thampy
74452	12-12-60	Improvements in or relating to the production of tolylene-di-isocyanates	S. R. Goel & R. T. Thampy

1961

78016	10-8-61	Improvements in the production of thermosetting resins	R. T. Thampy & M. Krishnan
79882	20-12-61	Improvements in or relating to the processing of textiles for imparting abrasion resistance and wash and wear characteristics	R. M. Desai, J. Varghese & J. C. Patel

1962

85172	17-11-62	Improvements in or relating to the production of diisocyanate	R. T. Thampy & S. R. Goel

85527	10-12-62	Improvements in or relating to a process for the oxidation of hydrocarbons	R. T. Thampy, M. S. Radhakrishna Rao & B. S. Trehan
85788	24-12-62	A process for the preparation of a catalyst for the manufacture of maleic anhydride	R. T. Thampy, S. K. Bhatnagar & B. S. Trehan

1963

88019	18-5-63	A yarn tension measuring and recording instrument	A. Pande, S. R. Ranganathan & G. S. Ganesan
90575	2-11-63	Improvements in or relating to polyesters	R. T. Thampy, M. Krishnan S. P. R. Nair & Miss T. Dey
90674	6-11-63	Activated carbon for phosgene manufacture	R. T. Thampy & S. R. Goel
90675	6-11-63	Improvements in or relating to the manufacture of phosgene (carbonyl chloride)	R. T. Thampy & S. R. Goel
91290	13-12-63	Improvements in or relating to an apparatus for the measurement of gel time of thermosetting resins	A. Pande, M. Krishnan & S. K. Bhatnagar

1964

92292	17-2-64	Improvements in or relating to the manufacture of phosgene (carbonyl chloride)	R. T. Thampy & S. R. Goel
92757	13-3-64	Improvements in or relating to the treatment of cellulosic materials to render them rot-proof and/or waterproof	R. M. Desai, A. K. Jain & S. M. Dhanigond
92758	13-3-64	Improvements in or relating to the treatment of cellulosic materials to render them resistant to micro-organisms	R. M. Desai, A. K. Jain & S. M. Dhanigond
93146	6-4-64	A yarn tension recording and measuring instrument	A. Pande & S. R. Ranganathan

Indian Institute of Science

1943

29967	7-9-43	A process and apparatus for the production of ammonium carbomate	J. C. Ghosh & B. S. Kulkarni
29968	7-9-43	Water-proof and gas-proof fabrics from castor oil products	M. Qureshi & T. V. Subba Rao
29969	7-9-43	An apparatus for the production of urea	J. C. Ghosh & B. S. Kulkarni

1945

32970	30-7-45	Improvements in or relating to compositions for electro-deposition of rubber	J. C. Ghosh & G. Verghese

33058	11-8-45	Improvements in or relating to rubber lining of non-conducting surfaces	J. C. Ghosh, G. Verghese & M. G. Ram
33115	24-8-45	Improvements in or relating to the rubber-lined metallic equipment	J. C. Ghosh, G. Verghese & M. A. Govinda Ram

1947

38823	30-12-47	Improvements in or relating to the production of distillery washes having alcohol concentration of 10 to 14 per cent by volume	S. A. R. N. Rao & M. Sreenivasaya

1948

39991	19-7-48	A process for the manufacture of a diastatically active moldly composition	M. R. R. R. Rao & M. Sreenivasaya
40112	12-8-48	A process for production of distillery yeasts of high potency	S. R. A. N. Rao & M. Shreenivasaya
40370	6-10-48	A process for the recovery of useful by-products in the manufacture of enzymes with special reference to diastases	M. R. R. R. Rao & M. Sreenivasaya
40753	27-12-48 Post dated to 14-9-49	Preparation of new biguanide compounds	P. C. Guha & S. S. Guha
40754	27-12-48	Preparation of chloro-phenyl-dithiobiuret	P. C. Guha & S. S. Guha

1950

43542	25-7-50	Improvements in or relating to fermentation processes	M. Sreenivasaya & S. R. A. Rao
44144	23-11-50	Improvements in or relating to the production of chlorinated rubber	J. C. Ghosh, B. S. Rao, M. R. A. N. Rao, N. H. I. S. Krishnan & G. S. R. Iyer

1956

56817	14-3-56	An improved compensator for transformers	P. V. Rao

1958

64168	23-5-58	Improvements in or relating to centrifugal pumps	N. S. Govinda Rao, K. Seetharamiah & H. C. Radhakrishna

Osmania University

1943

30316	20-12-43	Cold moulding composition for the manufacture of moisture resistant or insulating articles such as boards, switches, bottle-caps, trays, panels for radio receiving sets or the like	M. Qureshi & M. A. R. Khan

1944

30503	8-2-44	An improved pencil eraser	M. Qureshi & M. A. R. Khan
31284	8-8-44	Varnish from castor oil products	M. Qureshi & T. V. Subba Rao

1951

45695	20-8-51	Electroplating surface of non-conducting materials	K. Chakravarty, B. N. Ghosh & S. K. Roy
45696	20-8-51	Improvements in or relating to matallization of surface of non-conducting materials	-do-

Presidency College, Madras

1945

32486	10-7-45	Improvements in or relating to the manufacture of benzidine	B. B. Dey, T. R. Govindachari & S. C. Rajagopalan
33078	14-8-45	Improvements in or relating to the manufacture of para-aminophenol	B. B. Dey, T. R. Govindachari & S. C. Rajagopalan
33473	24-10-45	Improvements in or relating to the production of nitro derivatives of phenyl ethers	B. B. Dey, T. R. Govindachari & H. V. Udupa

1946

34411	21-3-46	An improved method for the conversion of nitro chlorobenzenes to the corresponding nitro anisoles and nitro phenetoles	B. B. Dey, H. V. Udupa & T. R. Govindhachari
34754	4-5-46	An improved process for the conversion of ortho-and-para-nitro chlorobenzenes to the corresponding nitro anisoles and nitro phenetoles	B. B. Dey, H. V. Udupa & T. R. Govindachari
34755	4-5-46	An improved process for the preparation of 2-nitro, 4-chloro phenetole	B. B. Dey, H. V. K. Udupa & T. R. Govindachari

34756	4-5-46	An improved process for the production of ortho-dichloro benzidine (3′, 3′-dichloro-4′, 4′-diamino diphenyl)	B. B. Dey, T. R. Govindachari & S. C. Rajagopalan
34757	4-5-46	A process for the production of 3, 6, 3′, 6′-tetrachlorobenzidine	B. B. Dey, T. R. Govindachari & S. C. Rajagopalan
35328	8-8-46	An improved method for the production of 2, 4-diamino phenol	B. B. Dey, T. R. Govindachari & H. V. Udupa

1947

37566	17-6-47	An improved method for the production of 2, 4-diamino-phenol	B. B. Dey, H. V. Udupa & B. R. Pai

1948

39426	1-4-48	An improved method for the production of 2, 4-diaminophenol	B. B. Dey, R. K. Maller, B. R. Pai & H. V. Udupa
39427	1-4-48	An improved method for the production of 2, 4-diaminophenol	B. B. Dey, R. K. Maller & B. R. Pai
39428	1-4-48	An improved method for the production of 4-amino-meta-cresol	B. B. Dey, R. K. Maller & B. R. Pai
39429	1-4-48	An improved method for the production of 4-amino-ortho-cresol	B. B. Dey, R. K. Maller & B. R. Pai
40261	14-9-48	A process for the production of 6, 6′-dichloro-3, 3′-diethoxy-benzidine (dichloro-ortho-diphenetidine)	B. B. Dey, R. K. Maller & B. R. Pai

Bombay University

1945

31594	28-10-44	Anthraquinone vat dyestuffs	V. V. Gokhale & K. Venkataraman
33261	19-9-45	Preparation of stabilized diazo salts and isodiazoelates from mono-ordi-aminoanthraquinones	R. J. Moualim & K. Venkataraman

1946

34210	26-2-46	Improvements in or relating to anthraquinone acid dyestuffs	S. G. Bedekar & K. Venkataraman
34211	26-2-46	A process for the preparation of 2 : 4 dichloro-1-amino-anthraquinone	S. G. Bedekar & K. Venkataraman

Science College, Patna

1944

31510	5-10-44	Improvements in or relating to the grinding and utilization of mica	R. C. Ray

31511	5-10-44	Improvements in or relating to the grinding and utilization of mica	R. C. Ray

1945

32834	10-7-45	Improvements in or relating to the manufacture of mica incorporated boards, slabs, tiles, or the like	R. C. Ray
32969	30-7-45	Improvements in or relating to the manufacture of paints from mica	R. C. Ray
33077	14-8-45	Improvements in or relating to the manufacture of plastic composition from pulverised mica	R. C. Ray
33114	23-8-45	Improvements in or relating to the manufacture of paints from mica	R. C. Ray

Banaras Hindu University

1947

37155	8-4-47	Improvements in or relating to the preparation of aluminium alloys	D. Sarup, V. G. Iyer & S. Ramamurthy

1951

45609	2-8-51	Radio signals fading recorder	S. S. Banerjee & R. R. Mehrotra

1955

53509	10-1-55	Preparation of titanium hydride	S. Ramamurthy

1956

56235	5-1-56	Preparation of titanium hydride	S. Ramamurthy

1953

49234	23-3-53	Preparation of titanium tetraiodide	S. Rmamurthy

Allahabad University

1949

41336	9-5-49	Improvements in or relating to the manufacture of radio volume controls	G. R. Toshniwal

1960

B H U

71302	31-3-60	Improvements in electronic wattmeters for measuring high and low power	S. S. Banerjee & A. V. Bhattacharya

B.B. & C.I.R., Ajmer

1946

36182	21-11-46	Copper-silicon bronzes	D. R. Malhotra, B. Prakash & B. D. Agarawal

Laxminarayan Institute of Technology, Nagpur

1948

39320	13-3-48	Improvements in or relating to the activation of bauxite for bleaching vegetable oils and fats	G. G. Sutaone, S. A. Saletore & P. S. Mene

1951

45840	14-9-51	Improvements in or relating to the accelerated heat bodying of drying oils	S. A. Saletore & P. Sen
45841	14-9-51	Improvements in or relating to the isomerization of drying oils such as linseed oil	S. A. Saletore & P. Sen

St. Xavier's College, Bombay

1949

40968	16-2-49 Post-dated to 14-11-49	The manufacture of a therapeutically active antibiotic substance containing pristimerin and dulcitol from *Pristimera indica* (Willd.) A. C. Smith, syn. *Hippocratea indica* Willd. (Celastraceae)	S. S. Bhatnagar, P. V. Divekar and N. L. Dutta
40969	16-2-49	Improvements in or relating to the manufacture of dulcitol	S. S. Bhatnagar, P. V. Divekar & N. L. Dutta
40970	16-2-49 Post-dated to 14-11-49	Manufacture of actve principle of therapeutic value designated by us as Pristimerin from *Pristimera indica* (Willd.) A. C. Smith, syn, Hippocratea Indica Willd. (Celastraceae)	S. S. Bhatnagar, P. V. Divekar & N. L. Dutta

Bengal Tanning Institute

1951

44485	24-1-51	Manufacture of picking band leather	B. M. Das, J. K. De & S. N. Bose
44486	24-1-51	Extraction of tanning from vegetable tanning substances	B. M. Das, B. Mookerjee & P. K. Sarkar

Allahabad University

1949

69919	2-12-59	A method for the preparation of guanidinoethyl phosphate	(Mrs) Radha Pant & S. S. Dubey

Indian Meteorological Office, Poona

1951

44746	9-3-51	A new instrument for the measurement of infra-red radiation from the atmosphere	R. S. Kale
45025	24-4-51	Improvements in or relating to electronic circuits with particular reference to the manufacture of a variance meter	Y. D. Altekar

1952

47264	8-5-52	A high speed recorder for use with infra-red spectroscope	A. U. Momin
47348	23-5-52	A micro-photometer for rapid examination of spectrum plates or the like densitometric measurements	A. U. Momin

Forest Research Institute, Dehra Dun

1953

49054	25-2-53	A process for the treatment of bamboo to further its utilization in the manufacture of pulp, paper, or the like	G. M. Vyas, R. V. Bhry & K. A. Chowdhuat

Bengal Immunity

1954

52003	26-5-54	Improvements in or relating to the preparation of quinoline compounds	U. P. Basu

University of Madras

1956

57268	7-5-56	A process for the preservation of sweet toddy (Neera) obtained from palmyrah trees	P. S. Sharma
58305	3-9-56	A process for the preservation of sweet today (Neera) obtained from palm trees	P. S. Sharma
59088	7-12-56	Production of delta-3-carene polymers	L. M. Yeddanapalli & R. Santhanam

Forest Research Institute, Dehra Dun

1956

57267	7-5-56	Improved process for obtaining pulp from bamboo for making cheap grade printing paper	G. M. Vyas, R. V. Bhat & K. A. Chowdhury

Delhi University, Delhi

1951

46405	19-12-51	A process for the preparation of tetraethyl pyrophosphate	P. L. Sawhney & T. R. Seshadri

1953

48873	30-1-53	Preparation of 0,0 diethyl phosphoric acid ester of 4-methyl umbelliferone	P. L. Sawhney & T. R. Seshadri

1953

50864	17-12-53	Preparation of 2-hydroxy-3·6-dimethoxy acetophenone	T. R. Seshadri & S. K. Mukherjee

1957

61484	20-8-57	Improvements in or relating to refining and utilization of cotton seed oil	T. R. Seshadri & Kailash Chander
61773	18-9-57	Improvements in or relating to refining and utilization of cotton seed oil	T. R. Seshadri & Kailash Chander
62262	12-11-57	Improvements in or relating to detoxification of cotton seed products such as cotton seed meal or cotton seed flour	T. R. Seshadri & Kailash Chander

1959

70169	26-12-59	Improvements relating to the method of preparation of anhydrous magnesium chloride	H. C. Gaur & W. K. Behl

School of Tropical Medicine, Calcutta

1956

58383	11-9-56	A method of isolation of sapogenins	R. N. Chakravarti & M. N. Mitra

Government of India Assay Department & Silver Refinery Project

1956

58384	11-9-56	A process for the recovery of copper from copper pyrites	G. C. Mitter, B. K. Bose & S. G. Dighe

Chemical Department, Panjab University, Hoshiarpur

1956

58902	16-11-56	A process for the preparation of 9 : 10 thiopegan derivatives containing phenolic hydroxy groups	K. Narang, H. S. Sachdev & K. S. Dhami

58903	16-11-56	Preparation of 2-hydroxy and 2-chlorothiazoles containing phenolic residues in position 4	K. S. Narang, H. S. Sachdev & K. S. Dhami

1957

61439	13-8-57 (Divisional date 16-11-56)	Preparation of 2-hydroxy and 2-chlorothiazoles containing phenolic residues in position 4	K. S. Narang, K. S. Sachdev & K. S. Dhami

Panjab University

1958

63353	10-3-58	A process for the preparation of 2-substituted amino-5-methyl-triangle^2 thiazolines	K. S. Narang, H. S. Sachdev & K. S. Dhami

Calcutta University

1958

63735	15-4-58	A process for the preparation of mycobacellin, an antifungal anti-biotic to combat fungal infections	S. K. Majumdar & S. K. Bose

Andhra University

1958

66196	22-12-58	A process for the isolation of new cardiac glycosides from the seeds of Thevetia neriifolia Jus's	S. Rangaswami & E. V. Rao

1959

66804	21-2-59	A process for the conversion of peruvoside to ruvoside	S. Rangaswami & E. V. Rao

Agra College, Agra

1963

87816	7-5-63	Device of studying the electrophoretic velocity of colloidal particles	Arvind Kumar, P. D. Bhatnagar & A. K. Bhattacharya

India Govt. Mint, Calcutta

1953

[illegible]	30-3-53	A process for the recovery of the constituent metals from copper base alloy scrap	G. C. Mitter, S. G. Dighe & S. D. Gokhale

49635	26-5-53	A process for the recovery of elemental sulphur from copper pyrites	G. C. Mitter, S. G. Dighe & S. D. Gokhale

P.S.G. College, Coimbatore

1960

71919	25-5-60	A universal fluid indicating manometer for flow indication in closed conducts	R. K. K. R. Govindaraja

School of Tropical Medicine, Calcutta

1960

73730	15-10-60	A process for the preparation of urease from red gram (*Cajanus* cajan)	R. Nath & T. K. Pradhan

Irrigation and Power Research Institute, Amritsar (Pb)

1961

77223	19-6-61	Bed-load sampler	H. L. Uppal

Nagpur University

1961

79107	31-10-61	A method for the preparation of glucose cycloacetoacetate hydrolysate (GCA, L)	M. C. Nath, J. M. Khanade & E. P. M. Bhattathiry

All India Institute of Medical Sciences, New Delhi

1962

80998	28-2-62	Isolation of a group of physiologically active compounds from Calophyllum inophyllum	R. B. Arora & T. R. Seshadri

Agra College, Agra

1962

81247	15-3-62	An improved moulding device for the preparation of soil specimens for unconfined compressive strength test	D. K. Sundd & A. K. Bhattacharya

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